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The
INVENTIVE AGE
A Journal of Manufacturing Industry and Scientific Progress.

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ELECTRO-METALLURGY OF IRON AND STEEL.

By E. OMMELANGE.

It has long been a cherished project of workers in iron to employ electricity for smelting. The first attempts date back half a century, but it is only within the last decade that the matter has been taken up seriously.

The first real success was obtained by a French engineer, Mr. Heroult, who in 1899 patented a practical furnace. This scientist, who had introduced the process of aluminium extraction by electricity, began with the utilization of the electric furnace for the production of special alloys of iron and steel. From this to the manufacture of high-class steel was a natural development. Later on, other processes were introduced; in France by Gin, Keller and Girod; in Sweden by Kjellin, and in Italy by Stassano. Considerable industrial progress has been made with the Heroult and Kjellin methods, and these may be considered to have taken a permanent place in the iron and steel industry.

Two distinct furnaces have been invented by Heroult, the one a modified form of the blast furnace, with electric heating for pig iron manufacture, the other a tilting electric crucible furnace for steel production. The principle of the original form of this smelting furnace was the continuous supply of the half-fused ore and fluxing materials to a column of coke, maintained at red heat by means of an electric current. This experimental furnace has been somewhat simplified in the light of more extended experience, and now consists of a box of square cross-section, lined with refractory material and open at the top. The bottom of the casing is provided with a carbon plate, which acts as one electrode of the circuit, the other being a movable block of carbon placed vertically in the open top of the furnace. The distance between the electrodes is varied by hand regulation. The charge, consisting of finely divided ore and coke, is placed in the space between the two electrodes, and also around the upper electrode, and fresh ore is added as the supply in the lower part of the furnace is reduced.

The electric crucible furnace consists of a closed shallow iron tank, thickly lined with a refractory material which will stand the high temperature attained within the furnace without undue softening or corrosion by the slag. This lining consists of dolomite brick, with magnetized brick around the openings. The hearth is formed of crushed dolomite, rammed on top of the lining of the bottom. The furnace is mounted on two curved rack bars, which permit of its being tipped sideways and held at any desired angle for discharging purposes. At the opposite side from the discharge lip there is an inlet for the air blast, and also an insulated supporting framework for carrying the two massive solid carbons, which convey the electric current. These can be moved either in a vertical or horizontal direction, by means of a special gearing. Openings are provided in the top of the furnace-cover for charging and for insertion of the electrodes, and also for the escape of the gases produced on heating the charge.

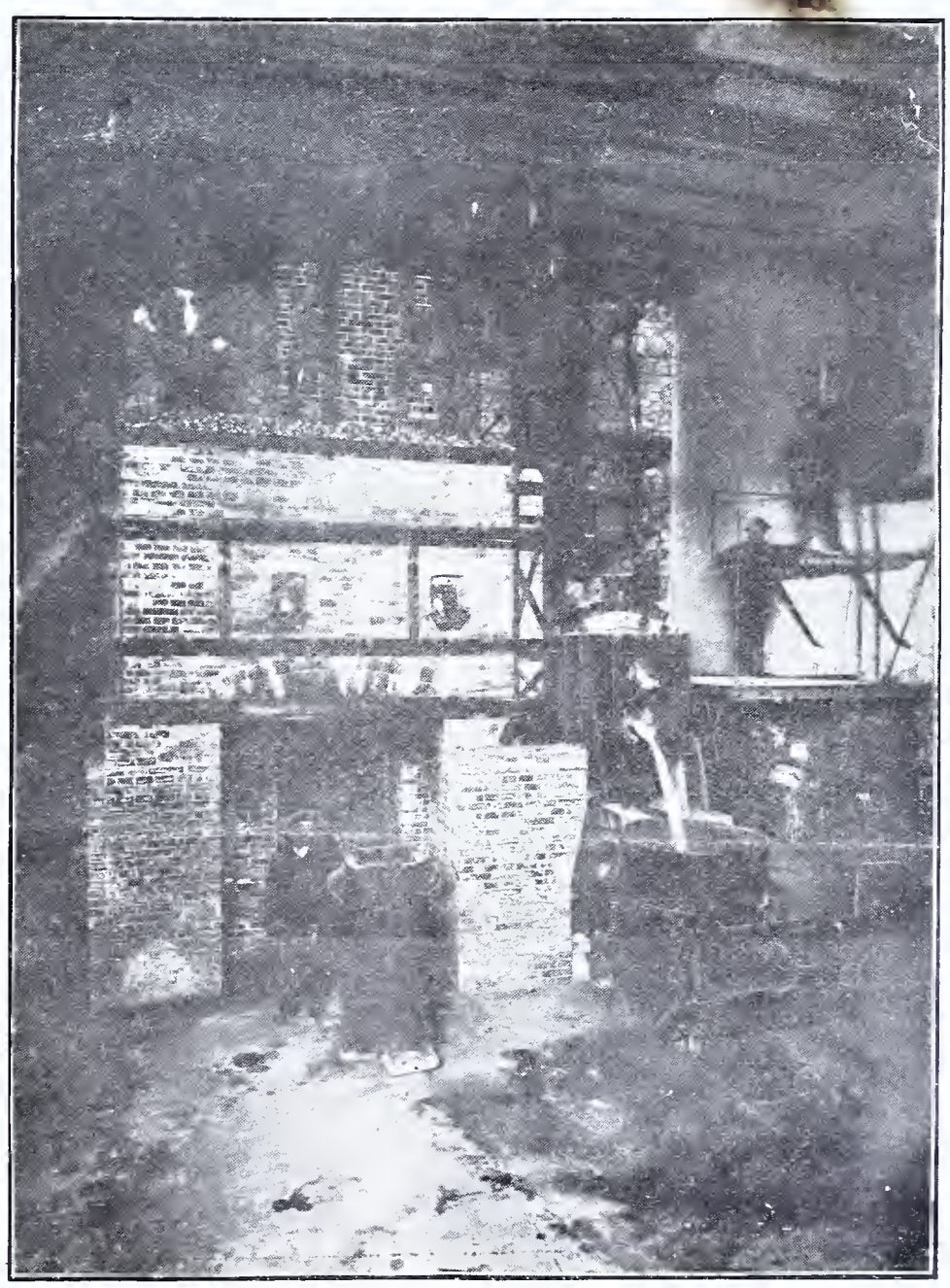


FIG. 1.—VIEW OF A KELLER ELECTRIC FURNACE IN OPERATION.

Steel is produced as follows in this furnace: A charge of steel scrap, pig iron, iron ore and lime—in the requisite proportions and quantities—is placed in the furnace, and this is raised to the melting point by combined arc and resistance heating. The slag formed by the lime and silicates of the ore rise and float on the surface of the molten metal, and the further heating of the charge is effected by allowing the electrodes to dip just below this slag, but not into the metal beneath it. An air blast is now allowed to enter the furnace at some suitable point, and under these conditions the impurities of the iron and steel scrap become oxidized and enter the slag. By pouring off this slag, therefore, and by renewing the materials which form it once or twice, a very pure product can be obtained. The process is in reality a washing-out process, in which the slag acts as a solvent. The fact that all the heating with this type of furnace occurs without any actual contact between the carbon electrodes and the metal, also conduces to purity of the products, since no silicon or carbon can enter into the iron or steel from the electrodes. When the iron in the crucible has been raised to the requisite degree of purity by this washing-out process, a calculated amount of an iron alloy, high in carbon

(carburite) is added, and the resultant steel is tipped into tbe casting ladle.

Tbe crucible furnaces usually employed for this process produce 3 tons of finished steel per charge, and two charges per day of 20 hours, tbe current required being 4000 amperes at 120 volts pressure or 480 kw. The following test shows the average chemical elements of this steel:

Iron, over 99 per cent., carbon 0.60 per cent., manganese 0.15 per cent., silicon 0.03 per cent., phosphorus 0.003 per cent., sulphur 0.007 per cent.

The Heroult steel-making furnace and process is in operation at La Praz and Froges, in France; Kortfors in Sweden, and Ramscheid in Germany. In tbe United States, the Halcomb Steel Co., of Syracuse, N. Y., have recently constructed a plant for the production of 80 tons of steel per day, by the Heroult furnace and process.

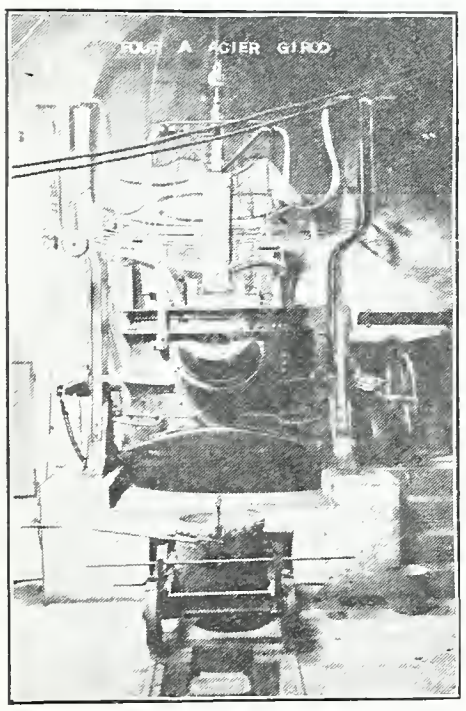


FIG. 2.—CIROD ELECTRIC STEEL FURNACE.

The cost of a 5600 lb., tipping furnace with all the accessories is given by Heroult as $10,000, while another $25,000 would be required for the electrode-making plant.

Tbe Kjellin furnace and process were invented by Mr. F. A. Kjellin, a Swedish engineer. The process, which was patented in 1900, has as its distinctive feature tbe use of induced currents for heating the iron. By this means the waste of heat occuring in the Heroult process, due to the unnecessarily high temperature of the electric arc, is avoided; while the disadvantages attending the use of the carbon electrodes are also overcome, since in the Kjellin furnace no electrodes are required. Owing to the comparatively low temperature obtained, the Kjellin furnace is, however, not adapted for dealing with impure materials. Further, the efficiency of the process is reduced by electrical difficulties, due to self-induction; and the superiority of the Kjellin system to the methods making use of combined arc and resistance heating with carbon electrodes, is less striking than might be expected, the chief gain being in the purity of the product, which resembles ordinary crucible steel.

The Kjellin furnace practically consists of a transformer with core; the primary is a coil supplied with alternating current and the secondary is the molten metal housed in an annular channel. The current in the metal is roughly that in the primary multiplied by the number of turns in the coil. An air space is provided for cooling; that is to say, for keeping down the temperature of the primary coil; and for tbis purpose a draft of air is produced, but water can also be used.

The first Kjellin furnace was erected at Gysinge, in Sweden, in March, 1900. The first practical furnace, however, dates only from May, 1902. It is capable of containing 4.000 lbs. of steel, and produces 9,200 lbs. of steel ingots per 24 hours, with an expenditure of power of 165 kw. and a current approaching 30,000 amperes in the secondary circuit. The energy consumption is therefore about 965 kw. hours per metric ton of steel. Only 1,900 to 2,240 lbs. of metal are poured at each casting, the remainder being left in to act as conductor for the current and to avoid stopping the turbine or alternator. To this molten metal left in tbe furnace, the proper quantity of iron and steel scrap are added to form the new charge, the proportion being calculated to yield steel of the desired composition.

The following figures give the average composition of Kjellin steel:

Iron, 99 per cent.; carbon, 0.500 per cent.; silicon, 0.194 per cent.: sulphur, 0.008 per cent.; pbosphorus, 0.010 per cent.

The cost of erecting a Kjellin furnace of 600 horse power capacity is stated to be about $4,100.

The fact that the famous Berlin Company, Siemens & Halske, has purchased the patent rights of the process and furnace for Germany and Austria, and that Messrs. Krupp are now erecting a Kjellin plant at their Essen works, proves clearly that this process has achieved a permanent position in the iron and steel industry.

The Keller furnace is in operation at the works of the Keller-Leleux Company, Livet, France. The Keller furnace (see Fig. 1) is of the resistance type, and consists of two iron-cased shafts, communicating below by a horizontal canal. The shafts are lined with refractory material, and each is provided with a massive carbon block electrode, slung on chains, and movable in either a horizontal or vertical direction. The base of each shaft is also provided with a carbon block electrode. electrically connected by thick copper bars passing outside the horizontal canal. In starting the furnace, the cbarge is introduced between the carbon blocks of the base and the ends of the electrodes. The current passes from one electrode through the material to be reduced, to the carbon electrode in the base of the furnace. From this it passes to the other base electrode by the external copper conductor, and through the charge in the second shaft in the reverse direction to that just described. When the electric resistance heating has caused portions of the charge to be reduced to the molten state and metallic iron to be formed, this collects on tbe bearth of each shaft and finally flows into a lateral canal. The current will now pass from one to the other of the iron-cased shafts, partly by the external conductor and partly by the molten metal in the lateral canal. As this fills up, the proportion of the total current carried by the external conductor diminishes. The electrodes are gradually raised as the charge in the shafts is reduced and melts, and fresh raw materials are charged into the vertical sbaft. Tbe external conductor between the two base electrodes enables the furnace to be worked continuously. Any temporary block or stoppage in the lateral canal, due to cooling, is overcome by the use of a supplementary electrode.

As a type of some importance, the Girod furnace is also worthy of mention. This furnace, cylindrical in shape, is mounted on trunnions, (see Fig. 2.) and is lined with magnesia brick. Tbe cover is made of silica brick and through this pass several carbon electrodes, all of which are connected to one pole of the electric supply circuit. The bottom of the furnace is formed of a number of water-cooled pieces of cast-iron, embedded in the brickwork. These plates act as the lower electrodes of the furnace, and each plate is in contact with the crucible part of the furnace by means of special canals.

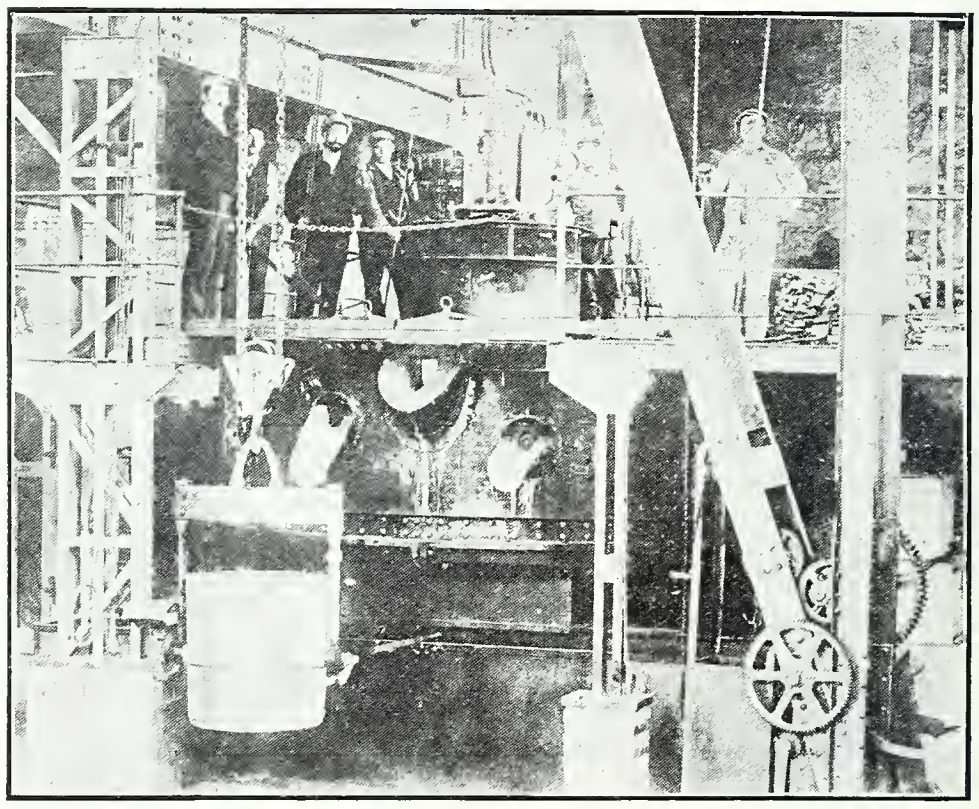


FIG. 3.—KJELLIN ELECTRIC FURNACE AT GYSINGE, SWEDEN.

Alternating currents are used. The charge consists of scrap and cast-iron in suitable proportions. The upper electrodes are suspended in the slag, which is made up from special ores, and the decarburization of the charge is carried as far as possible, to eliminate all the impurities of the raw iron. The steel is then recarburized by adding a calculated weight of bigh carbon metal. Girod has also patented a large number of forms of crucible furnaces in which the charge is melted by resistance heating, the crucibles being embedded in a crushed mixture of carbon and silica, and a large number of crucibles being placed in one furnace. This furnace, however, has not yet been applied to steel making upon an extensive scale.

Comparisons between yields and costs for the different furnaces and processes are very difficult, owing largely to the variation in the cost of electric power in different localities and tbe different methods of working the furnaces. The figures obtained show however that, as regards tbe manufacture of steel from scrap and pig iron, charged cold, the Heroult, Kjellin and Keller furnaces all yield results in the neigbborhood of 800 kw. hours, wbile the Girod furnace has an energy consumption 50 per cent. higher. The Heroult and Keller furnaces and processes are able to deal with more impure materials than the Kjellin furnaces, since the use of the electric arc as a source of heat produces a much higher temperature than induction beating, and this enables all tbe impurities of the raw iron to be oxidized and removed in the slag. On the other hand, the Kjellin furnace and process gain by the absence of carbon electrodes and by the generation of heat entirely within the material contained in the furnace. The costs of operating and of maintenance are thus greaty reduced, and this saving balances the higher expenditure upon raw materials. It is, however, probable that each type of furnace will be found adapted for the production of steels of special quality, and that both the arc type of crucible furnace (represented by the Heroult and Keller furnaces) and the induction type (represented by the Kjellin and Hiorth furnaces) will attain a permanent position in the steel industry of the future.

Corncob Houses.

Corncobs are used for building purposes in Germany and parts of Russia. The cobs are crushed by compresses and molded into blocks resembling bricks. These blocks are bound with wire to hold them together, and soaked in tar to make them watertight. They are then ready for use. They have the advantage of being lighter than bricks, are always dry, and make good houses.

A UNIQUE INSUBMERGIBLE LIFE SAVING BELT.

By Frank C. Perkins.

SEVERE tests have been made by the English Admiralty of a new insubmergible life belt, designed by Jack Focketyn, of Antwerp, Belgium. This life saving apparatus, shown in the accompanying photo, prevents death by immersion, as the wind or waves cannot make the body capsize in the water, a person wearing one of these belts always remaining in a vertical position. It is of scapular shape, composed of a breast cushion and a dorsal cushion fashioned so as to present the maximum thickness towards the upper part. The shape of



the apparatus and its lightness allow entire freedom to the limbs so that a seaman or any person wearing it can swim without inconvenience. On account of the density of the stuff composing the filling, the device conserves its resisting and floating power in case of any such accident as a tear.

It is well known that if a person using a life saving belt at night can be provided with a light of some kind, the chances of rescue are enhanced. In this apparatus, a cap has been designed with an electric oil lamp attached, which can be seen for a distance of about a quarter of a mile.

It is claimed that on account of the position of the cushion of this life saving belt, the neck is protected against the stroke of the waves, which prevents the head from tossing about in case of syncope and preserves the muscles from fatigue. Owing to the shape and softness of the cushion, the apparatus serves as a pillow, holding the head always above the water.

Automobiles for the Arctic.

Although the motor cars in the recent race around the world failed to go through Alaska, the automobile is to play an important role in Arctic exploration in the future. The conviction is gaining ground that it is only through some automatic means of transport—either on land or in the air—that the conquest of the poles can be achieved. No less than four expeditions are now being thus fitted out for research, not only in the northern regions but in that most inaccessible of all known sections of the globe, the antarctic circle. A European party that intends to explore the vast ice fields in the vicinity of the South Pole is having an ice auto built according to special designs. The back wheels of the machine are fitted with round bars of iron to grip the snow, and when the surface is hard and slippery, spikes are to be screwed into holes made with this object, thus giving a grip to the wheels. The front wheels are to have solid rubber tires, and are then mounted on runners. The engine has no water jacket, as the water would at once congeal in the low temperature of the antarctic. A pipe from the exhaust is to pass under the footboard and serve as a foot warmer, and will also go through a small tank so as to melt snow for domestic purposes.

The discovery of the South Pole itself is not being looked forward to with so much expectation by scientists as the revelations that will be made on the way there. It is believed that these will be of more practical value to mankind than the mere achievement of reaching the antipodes, either in the north or south. French writers hold that the finding of fossils in the antarctic region may throw much light on the theory of evolution. It will be remembered that the recent discovery of fossils in Patagonia unsettled a number of the ideas held regarding the progress of evolution. Development appears not to have been continuous in the two hemispheres, and science believes that it is to further discoveries in the antarctic that the world must look for a solution of the problem of life. Dr. Nordenskjold, the Swedish explorer in those frozen plains, found fossil imprints of tropical vegetation, from which it must be inferred that in past ages such plants flourished in the proximity of the South Pole. If this is true, man as well may have dwelt in these glacial regions, and some day the world may discover traces of savage or civilized races behind the barriers of ice.

More mystery attaches to the South Polar world than to the North Polar; it is even more difficult of approach and exploration, and it is known that influences emanate therefrom that affect the physical world. The antarctic waters seem to play a serious part in the maritime circulation of the globe, and one scientific writer has asserted that the South Pole must be the cradle of the tides. From this inhospitable land flow the freezing currents that affect the temperature of the gulf stream in the Atlantic, and, mingling with the great stretches of the Pacific, tend to regulate the movements of its waters as far north as the Aleutian Islands. The mighty gales that arise in the Antarctic prove that it is in a sense the home of the winds; and until the action of such an extremely disturbing area is known, forecasters will not be able to formulate accurate prophecies of the weather.

A New Cement.

Concrete has been crowned king among structural materials. From the humble beginning of paving streets and lining sewers, it has risen to employment in towering buildings and ambitious bridges. For roofing tiles, for dams, for chimneys, for fence posts, even for railroad ties and telegraph poles, concrete has been used and always with success. Scores of patents are taken out every month for new applications of this wonderful material. and new varieties of cement are constantly being produced. One of the latest is called iron-ore cement, and it is entirely impervious to sea water.

In preparing this product, pure chalk, roasted flint stone, finely ground, and ferric oxide are employed. The last is obtained partly from bog-iron ore and other pure iron ores, and partly from pure gravel waste. After the flint stone and ferric oxide have been ground, all three materials are worked together into a moist paste. This is then dried and burned to a clinker in a rotary kiln. Grinding is the next step, and during this part of the process a small portion of raw gypsum is added, the resulting product being the ore cement. which can be used with efficiency in works constructed in sea water, where ordinary Portland cement would in time deteriorate. Tests made in water containing more salt than ordinary sea water, show that the strength of the ore cement increases the longer it is immersed. This material is manufactured in Germany, and our consul general at Berlin, in describing it, adds that it is also adapted for use in coal mines, potash mines. and similar constructions where it is exposed to water containing a high percentage of sulphate.

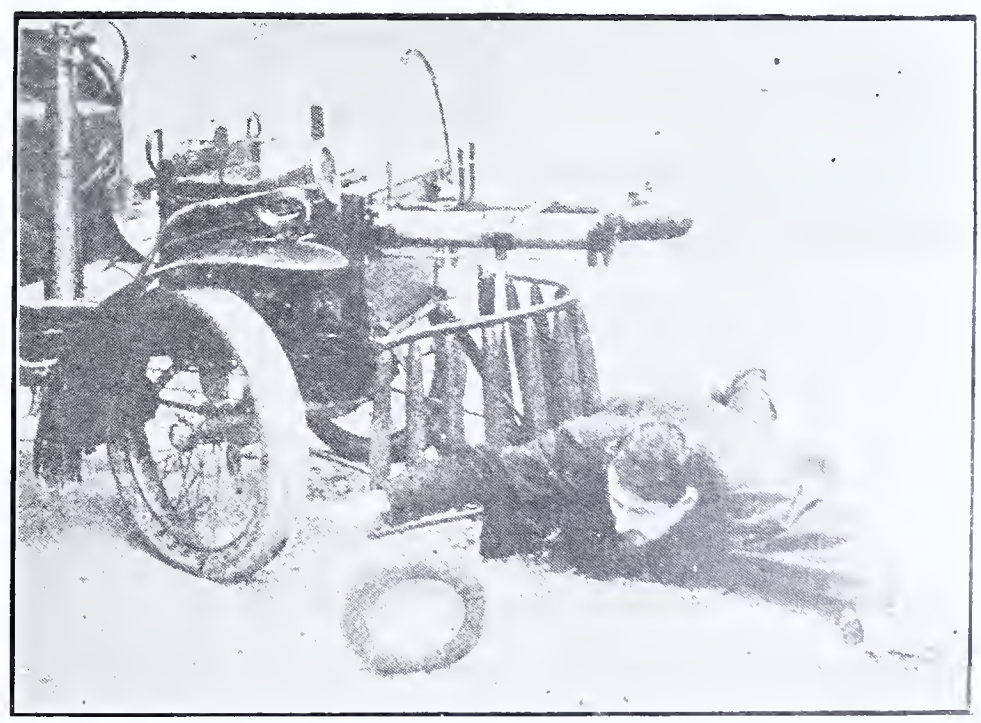
Paper from Peat.

Arrangements are being made in Sweden for the manufacture of pasteboard and wrapping paper from peat. The invention, it is said, is an American one, but it is believed that Swedish peat is more suitable for the purpose than the product in the United States. The factory, which will start this year, will convert the peat into paper within a few hours, and will operate on a large scale.

THE INVENTIVE AGE contains sound advice to inventors and patentees. For lack of such advice many have lost money. Subscription price, one dollar a year.

An Automobile Guard.

With the growing use of motor cars for various purposes, it is becoming almost as important to have some sort of a life-guard attached as it is to have fenders on locomotives and street cars. If a really practical automobile guard could be devised, the inventor might make a fortune, for there is already talk of legislation for the protection of pedestrians from motorists. A great number of accidents are daily reported, many of which could be avoided by the use of some such device as that shown in the illustration. As will be seen, it is in the nature of a buffer or cow-catcher, and in the trials given it was found to work most effectively. The inventor, as shown in the cut, threw himself in front of the machine when it was traveling at a moderately fast rate of speed; and although he was wrapped in a cloak and quite helpless to extricate himself, he escaped without injury, and was only shaken and somewhat bruised. This fender is simple of construction, can be easily attached to any automobile, and is not unsightly—a common objection on the part of motorists to such devices.



FOR THE PROTECTION OF PEDESTRIANS.

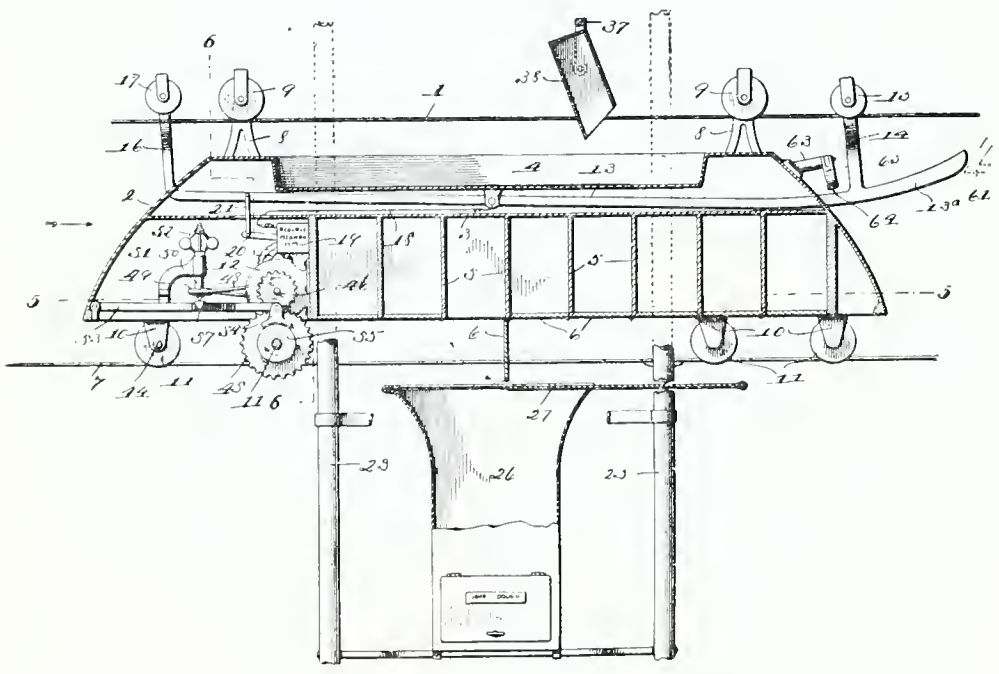
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CLEVER NEW PATENTS.

MAIL CARRIER.—IRRIGATION SYSTEM AND SPRINKLER.—SLEIGH RUNNER ATTACHMENT FOR VEHICLES.

Mail Carrier.

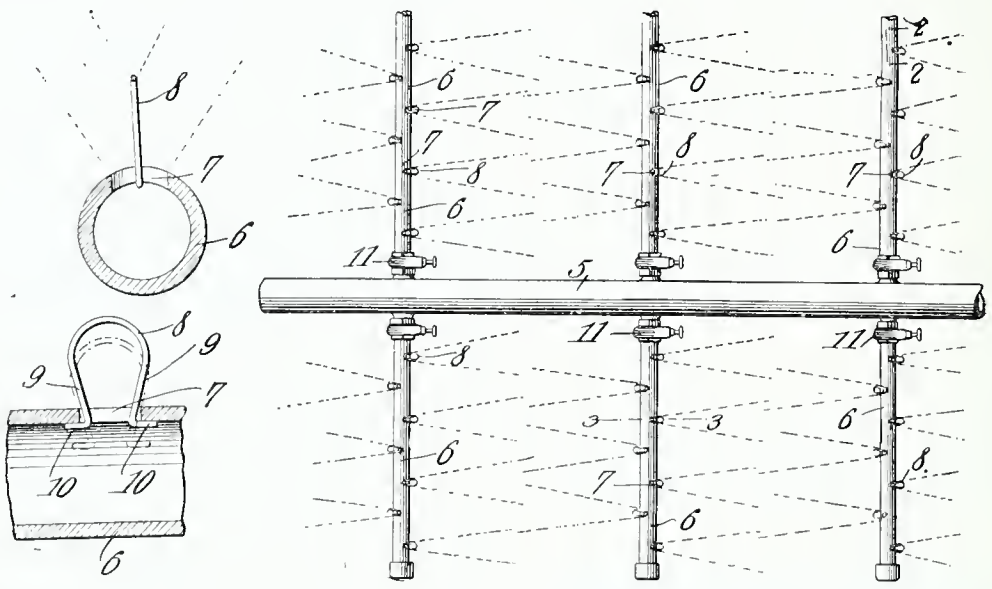
An improved automatic distributing and collecting system for mail is the subject matter of a patent which has recently been granted to Charles B. Crabtree, of Manchester, Illinois, and is especially adapted for use in rural districts as a substitute for the letter-carriers now employed. The invention embodies a mail-car which travels upon elevated cables and is preferably driven by a small electric motor. Receiving and delivering stations, which are arranged wherever desired along the route, are respectively adapted to automatically receive mail from, and deliver mail to, the car while the same is in motion. From the accompanying illustration it will be observed that the invention comprises a pair of parallel cables 7 on which a mail-carrying car is adapted to travel. A trolley wire 1 is arranged above the cables and car, and is designed to furnish current through the medium of the trolley-poles 14 and 16, to an electric motor 12 for propelling the same. The roof of the car is depressed to form a mail-receiving receptacle 4, and the lower portion of the car is formed into a plurality of boxes having downwardly swinging bottoms, which boxes equal in number the number of delivery stations on the route. Each of the mail-receiving stations along the route is provided with a receptacle 26 for the mail, which is mounted upon a suitable framework 23, and arranged below the cables 7. Mail to be distributed is placed in the boxes by means of the drops, and the car is then started from the post-office end of the route. The car, as it passes each station, operates a trip



which automatically decreases the speed of the car, and also causes mechanism to be actuated to trip the bottom 6 of one of the boxes, which will discharge the mail from the bottom of the car into the receptacle 26. Simultaneously, the box 37, holding the outgoing mail, will be automatically dumped and the mail discharged into the mail-receiving receptacle 4 in the top of the car. Means are provided through a special construction of pulleys and reversing mechanism, whereby the car is automatically reversed and started upon its return trip when it has reached the end of the line.

Irrigation System and Sprinkler.

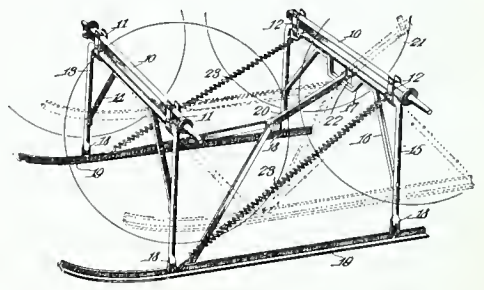
In these days of growing tendencies toward intensive cultivation, the up-to-date agriculturist realizes that he must not depend upon the uncertain sources of water supply provided by the clouds, but must have some system of irrigation to protect his crops from drouth. Among the many new devices for irrigation and sprinkling, that of Thomas K. Godbey, of Waldo, Fla., has certain special advantages. It is particularly designed for use on growing vegetation, and comprises a main pipe 5 (see drawing) leading from a source of water, and provided with a plurality of lateral branch pipes 6, having perforations 7 through which the water is discharged over the ground. Slidably mounted in the perforations 7, are one or more spraying elements 8, formed of a piece of wire, bent into U-shape to form spring arms 9, the terminals of which form stop fingers 10 adapted to bear against the interior walls of the adjacent branch pipe, thereby limiting the outward movement of the spraying element. The distance between the arms 9 at the stop shoulders 10 is less than the diameter of the discharge opening or perforation, so as to permit the spraying element to move freely, without friction. It will be seen that water flowing through the pipes will pass through the orifices 7 and coming in contact with the curved walls of the spraying elements, will be divided into a film or spray, as shown in the drawing. The water, striking the closed ends of the spraying elements, oscillates the latter within the perforations, thus keeping them in constant motion and preventing the perforations from becoming clogged with deposits of dirt. In using the sprayer, the spring arms 9 are pressed inward until the bases of the stop fingers come in contact with each other, in which position the spraying element may be easily introduced within the adjacent orifice. When the pressure on the arms 9 is released, the spring will force the fingers laterally in engagement with the inner walls of the conductor, locking the sprayer against accidental displacement. When the water



is cut off, the spraying elements drop by gravity to the dotted line position shown in the smaller cut; and when the water is admitted, the pressure will lift the spraying elements to the full line position, thus maintaining the perforations free from obstructions.

Sleigh Runner Attachment for Vehicles.

Every one who lives within the regions where snow falls has felt the need, at some time, of means for changing a wheeled vehicle into a sleigh. The latest device in this line has just been patented by Francis Korff, of Lansing, Mich., and it is specially adapted for use on baby carriages. Upon the axles of the vehicle are mounted, in bearings, U-frames 13 and 15 (as shown in the drawing), so arranged that the legs extend downward, and are substantially vertical when the sleigh runners are in operative position. Located medially of the frame 15 is a brace iron 16, provided with a downwardly bent portion. The U-frames have the lower ends of their legs flattened, and pivoted thereto are iron runners 19, with upwardly bent forward ends. A Y-bar 20 is pivoted to the runners and passes between the U-frame 15 and the downwardly bent portion 17 of the brace. This bar has a notch 21 adapted to engage the downwardly bent portion, and a stop 22 to prevent said Y-bar from being displaced. Springs 23 tend to hold the parts in the position shown in dotted lines in the cut.



When it is desired to use the vehicle with wheels, the Y-bar is raised so as to disengage the slot 21 from the portion 17, and the springs 23 will then pull the sleigh runners up. To convert the vehicle again into a sleigh, the Y-bar is pushed down until the slot 21 engages the portion 17. As will be seen, the operation is extremely simple, and yet effective.

PATENTS

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LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

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AMERICAN LAVA CO. et al. v. STEWARD et al.

(Circuit Court of Appeals, Sixth Circuit. July 24, 1907. 155 F. R. p. 731.)

1. PATENTS — VALIDITY — SUFFICIENCY OF DESCRIPTION.

Where the essence of an invention is the location, form, size, or any other characteristic of the means employed, the patentee must distinctly specify the peculiarities in which his invention is to be found.

2. SAME—AMENDMENT OF APPLICATION.

An amendment to an application for a patent made to introduce a new theory of the invention, and which contains new claims covering a process based on such theory, neither of which was mentioned in the original application, if permissible as within the invention, should be verified by the oath of the inventor.

3. SAME-MECHANICAL AND PROCESS CLAIMS.

While it is competent, when the circumstances permit it, for an inventor in describing a machine or apparatus which he has devised to make a claim for a process which his patented device is capable of carrying out, to entitle him to do so, the process must be one capable of being carried out by other means; otherwise the claim is merely for a function of the machine; and, unless such other means are known or are within the reach of ordinary skill or judgement, the patentee is bound to point them out.

4. SAME—ANTICIPATION — ACETYLENE GAS BURNERS.

The Dolan patent, No. 589,432, for an acetylene gas burner, and the process embodied therein, claims 1, 2, and 3 are void (1) for anticipation, especially by the French patent to Bullier of April 20, 1895; and, additions thereto (2), for indefiniteness of description; and (3) because they were new claims based on a new theory of the principle of the invention added by an amendment to the application made in the Patent Office which was not verified.

GENERAL ELECTRIC CO. v. BULLOCK ELECTRIC & MFG. CO.

(Circuit Court, D. New Jersey. August 12, 1907. 155 F. R. p. 740.)

1. PATENTS—INFRINGEMENT—ARMATURES.

The Morrow patent, No. 504,401, for an armature for dynamo electric machines, claim 2, which covers an armature core comprising layers of segmental laminæ dovetailed to an internal supporting shell, the function of the dovetail connection being to lock the laminæ to the spider for driving purposes, and also to do so in such a manner that they cannot be driven from the spider by centrifugal force, was not anticipated as to the latter feature, and discloses patentable novelty: also held infringed.

2. SAME—ANTICIPATION.

The Reist patent, No. 559,910, for an armature for a dynamo electric machine, is void for anticipation as to all three of its claims. Claim 2, if possibly novel, held not infringed.

WESTINGHOUSE ELECTRIC & MFG CO. v. PRUDENTIAL INS. CO. OF AMERICA.

(Circuit Court, D. New Jersey. August 12, 1907. 155 F. R. p. 749.)

PATENTS—NOVELTY AND INFRINGEMENT—FASTENING MEANS FOR CORE PLATES.

The Nolan patent, No. 582,481, for fastening means for core plates of electrical machines, consisting of a ring for holding the laminæ of an armature in place, describes a useful device; but, in view of the previous common use of rings for a similar purpose in other structures, claims 1 and 3 are void for lack of patentable novelty. Claims 2 and 4 include as an additional element a shoulder bearing against the ring to retain it in position, and were not anticipated, and disclose invention: also held infringed.

DIAMOND STONE SAWING MACH. CO. OF NEW YORK v. BROWN et al.

(Circuit Court, E. D. New York. Aug. 16, 1907. 155 F. R. p. 723.)

1. PATENTS—MEASURE OF DAMAGES FOR INFRINGEMENT—LICENSE FEE.

An agreement between the owner of a patent and 12 licensees, fixing a uniform license fee to be paid by each for the use of the patented machine, together with the exaction of the same fee from subsequent licensees, is sufficient to establish a general acquiescence in the reasonableness of such fee and to make it a proper measure of the damages recoverable for a subsequent infringement by a stranger to such licenses; but it can be accepted only as fixing the market value of the use of the machine from and after the time when the first agreement was made, and any recovery for infringement prior to that time must be based on other evidence.

2. SAME—INTEREST.

Damages for infringement of a patent can be considered as liquidated, because an established license fee renders such damages easily determinable. so as to render the infringer liable for interest from the dates when the license fee would have been payable, had he been a licensee.

UNITED SHOE MACHINERY CO. v. DUPLESSIS SHOE MACHINERY CO.

(Circuit Court of Appeals, First Circuit. August 2, 1907. 155 F. R. p. 842.)

1. PATENTS-TERM-EXPIRATION OF FOREIGN PATENT.

The claim that the British patent covering an invention also patented in the United States was taken out by an intermeddler, and was unauthorized, and therefore that its expiration did not affect the term of the American patent, cannot be sustained, where the American patentees authorized the taking out of a patent in England, and under the other circumstances named in the opinion, did not repudiate the one in fact obtained until after its expiration.

2. SAME—SOLE SEWING MACHINE.

The French and Meyer patent, No. 412,704, for a sole sewing machine, expired Sept. 17, 1902, with the expiration of the term of the prior British patent, No. 13,366, 1888, granted to the same patentees for substantially the same invention.

LIBERTY MFG. CO. AMERICAN BREWING CO.

(Circuit Court, W. D. Pennsylvania. Sept. 9, 1907. 155 F. R. p. 900.)

PATENTS—INFRINGEMENT—TUBE CLEANER.

The Elliott patent, No. 641,092, for a rotary tube cleaner, was not anticipated, and discloses invention; also held valid as against the claim of prior use, and infringed.

DWINELL-WRIGHT CO. v. CO-OPERATIVE SUPPLY CO.

(Circuit Court, E. D. Pennsylvania. May 29, 1907. 155 F. R. p. 909.)

TRADE-MARKS AND TRADE-NAMES.

The name "White House," and the picture of the White House at Washington, held, upon final hearing, to constitute a valid trade-mark and trade-name for plaintiff's coffee.

KELSEY HEATING CO. v. JAMES SPEAR STOVE & HEATING CO.

(Circuit Court, E. D. Pennsylvania. Aug. 31, 1907. 155 F. R. p. 976.)

1. PATENTS — INVENTIVE ADVANCE — APPROVAL BY PATENT OFFICE.

Where none of the devices relied upon by the defendants is a direct anticipation of the patented combination in suit—none having all of its features, and those which are made use of in some not being exactly the same character, or put together in exactly the same way—although the inventive advance shown may not be large, the Patent Office having put the seal of its approval upon the invention, it will not be set aside.

2. PATENTS—INVENTION APPROPRIATION BY DEFENDANT OF ESSENTIAL FEATURES.

Where the defendants, instead of devising something for themselves, or taking up with some of the many forms open to them, have been so attracted by the complainants' device as to appropriate all its essential features, which they have copied slavishly, even to the name under which it is sold, affirming, as they thus do, in the most pronounced way possible to its superior merits and their own inability to do better, they cannot well complain if the inventive originality which is claimed for it is held to sufficiently appear.

3. PATENTS — INFRINGEMENT — CHANGE OF FORM.

The mere splitting up or multiplying of parts of a patented structure, the functions remaining the same, does not avoid infringement.

4. SAME—CONSTRUCTION OF CLAIMS-USE OF REFERENCE LETTERS.

The use in a claim of a patent of letters of reference to the drawings does not necessarily limit the inventor to the exact form or configuration of parts which is thus portrayed and described, without regard to possible equivalents. It may or it may not, according to circumstances. It is, after all, a matter of construction, in which, while a reference by letters to the drawings and specifications may be regarded, as a rule, as involving a greater particularity of description than without them, the real scope of the invention is nevertheless to be considered and given due weight. No doubt there are cases when, by reason of the limitations imposed by the prior art, it is necessary, in order to distinguish and save the invention, to confine it to a certain form or arrangement of parts, which the use of reference letters may serve to do; but, where no such necessity exists, the patent is to be taken as a whole, effect given to the invention as it is there disclosed and claimed, in which the reference to the drawings merely goes in with the rest.

5. SAME.

In a patent for a combination of elements in a hot-air furnace having vertical flues, with flanges on the upper end for supporting the crown sheet, the fact that, as shown in the drawings and referred to by letters in the claims, such flanges are on the outside of the flue, does not limit the inventor to such form, where it is not an essential feature of the invention, and their transfer to the interior of the flue, where they perform the same function, is a change of form merely, which does not avoid infringement.

6. SAME—HOT-AIR FURNACE.

The Kelsey patent, No. 476,230, for a hot-air furnace, while for a combination of old elements, and not of broad scope, was not anticipated and discloses invention: also held infringed.

GORMLEY & JEFFERY TIRE CO. v. PENNSYLVANIA RUBBER CO.

(Circuit Court, W. D. Pennsylvania. Sept. 9, 1907. 155 F. R. p. 982.)

PATENTS—INFRINGEMENT—WHEEL TIRES.

The Jeffery patents, Nos. 454,115, 466,565, 558,956, and 523,314, each for a wheel tire, and covering improvements in pneumatic tires, construed, and held not infringed.

WESTERN TUBE CO. v. RAINEAR.

(Circuit Court, E. D. Pennsylvania. Aug. 8, 1907. 156 F. R. p. 49.)

1. PATENTS—INVENTION—SUBSTITUTION OF MATERIALS.

While the substitution of one material for another is not as a rule patentable, there may be invention in substituting a different metal in one member of a device where both were previously made of the same, when by the union of the two metals certain hitherto imperfectly attained results are accomplished.

2. SAME—ANTICIPATION&CHANCE — COMBINATION.

Prior knowledge and use which will anticipate a later patent is not to be made out by a chance combination made without appreciation of the principle upon which the patent is based.

3. SAME—INFRINGEMENT.

The splitting up or multiplication of parts of a patented device without any new function or result does not avoid infringement.

4. SAME—PIPE COUPLING.

The Hewlett patent, No. 640,197, for a pipe coupling, which consists essentially in the combination in a pipe coupling of an ordinary construction of a brass spud and an iron nut and tailpiece, whereby there is brass to iron at the screw joint and at the opposing ends of tailpiece and spud, thereby avoiding the rusting of the joint and securing a closer union of such opposing ends, was not anticipated and discloses invention: also held infringed.

INTERNATIONAL POSTAL SUPPLY CO. OF NEW YORK v. AMERICAN POSTAL MACHINES CO.

(Circuit Court of Appeals, First Circuit. Oct. 9, 1907. 156 F. R. p. 362.)

1. PATENTS — INFRINGEMENT—STAMP CANCELING MACHINES.

The Laass and Hey patent, No. 388,366, and the Hey patent, No. 632,527, for stamp canceling machines of the type in which the letter actuates the printing mechanism, construed, and held not infringed.

2. SAME.

Bates v. Keith, 84 Fed. 1014, 28 C. C. A. 638, as to implements of universal use, applied, and decision of the Circuit Court of Appeals for the Second Circuit in Groth v. International Postal Co., 61 Fed. 284, 288, 9 C. C. A. 507, followed.

OLIVER TYPEWRITER CO. v. AMERICAN WRITING MACHINE CO.

(Circuit Court, N. D. New York. Oct. 15, 1907. 156 F. R. p. 177.)

TRADE-MARKS AND TRADE-NAMES SUIT FOR UNFAIR COMPETITION — PRELIMINARY INJUNCTION.

In a suit for unfair competition by defendant in obtaining and selling typewriters made by complainant at less than its established prices, and in so representing them in its circulars as to injure complainant's business, the showing made on an application for a preliminary injunction held not such as to entitle complainant to an injunction in advance of a full hearing on the merits.

WEISSENTHANNER v. DODGE METALLIC CAP CO.

(Circuit Court, D. New Jersey. October 26, 1907. 156 F. R. p. 365.)

PATENTS—ANTICIPATION-BOTTLE STOPPERS.

The Weissenthanner patent, No. 801,281, for a sheet metal stopper for bottles, etc., having a securing flange provided with a tongue, and being weakened by slits adjacent to said tongue so that it may readily be ruptured and removed by means of the tongue, is void for lack of novelty and invention, having been anticipated by the Calleson patent, No. 708,528; the two devices differing, if at all, only in the degree to which the slits are extended.

ST. LOUIS STREET FLUSHING MACH. CO. et al. v. AMERICAN STREET FLUSHING MACH. CO.

(Circuit Court of Appeals, Eighth Circuit. Oct. 22, 1907. 156 F. R. p. 576.)

1. PATENTS — INVENTION — NEW COMBINATION OF OLD ELEMENTS.

To accomplish a new and useful result within the meaning of the patent law (Rev. St. § 4886 [U. S. Comp. St. 1901, p. 3382]), it is not necessary that a result before unknown should be brought about, but it is sufficient if an old result is accomplished in a new and more effective way; and, if the value and effectiveness of a machine are substantially increased by a new combination of old elements, such combination is patentable.

2. SAME—EVIDENCE OF INVENTION.

That a defendant charged with infringement of a patent for a machine abandoned the machine he was previously making, and adopted that of the patent, that its engineer claimed to be the inventor thereof, and himself applied for a patent, and that the patented machine has largely superseded others previously in use for the same purposes, are all facts entitled to weight on the question of invention.

3. SAME—SCOPE—LIMITATION BY PROCEEDINGS IN PATENT OFFICE.

Where an applicant for a patent repeatedly acquieseed in the rejection of broad claims and substituted therefor narrower ones until his application was granted, the owner of the patent cannot be heard to insist that the narrower claims allowed shall cover the same as the broader ones rejected.

4. SAME—INFRINGEMENT-STREET FLUSHING CART.

The Ottofy patent, No. 795,059, for a street flushiug cart, covers a device for scouring and flushing streets by foreing water under pressure from a tank located on a moving cart, connected by a pipe extending downward to near the surface of the street, forward to the rear wheels, to nozzles having narrow elongated delivery apertures, and so adjusted that the water is forced out of the apertures in a flat sheet nearly parallel with the surfaee of the street in a forward and lateral direction, so as to loosen up the dirt and force it away to the sides of the street, and into the gutters, without injury to the surface of the street. The combination of parts by which such result is effected was not anticipated, and diseloses invention; but the patent is limited by the prior art to the combination and means shown for producing such flat stream nearly parallel to the street. As so construed, held infringed.

WESTINGHOUSE ELECTRIC MFG. CO. v. MONTGOMERY ELECTRIC LIGHT & POWER CO.

(Circuit Court of Appeals, Second Circuit. June 27, 1907. 156 F. R. p. 582.)

PATENTS—ANTICIPATION—ELECTRICAL DISTRIBUTION.

The Stanley patent, No. 469,809, for a system of electrical distribution, was not anticipated by the Zipernowski and Deri article published in London in 1885.

MECHANICAL INVENTIONS AND DESIGNS.

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Levi D. Gibson, Hartshorn, Okla., inventor; H. F. Scheer, Dallas, Tex., assignee. Car Door Opener.—An object of this invention is to provide a car door opener adapted to be readily applied to cars at a small cost, obviating the use of hammers and other tools in opening a door and enabling a car door to be quickly opened without injury. Another object of the invention is to provide a car door opener adapted to retain a car door on a car and thereby prevent the door from falling off and becoming lost.

George M. Ayles, New Albany, Ind. Frogless Switch.—An object of the invention is to provide a frogless switch, adapted to afford a continuous rail from terminal to terminal of a railway, and thereby effectually prevent the accidents resulting from the use of frogs. Another object of the invention is to provide a switch of this character with means for simultaneously locking the switch-operating lever and the movable rail, which takes the place of the frog, whereby the switch after being once set for the main line or the siding, will be effectually prevented from becoming accidentally displaced.

Walter A. Garrigus, Chattanooga, Tenn., and Robert Golling, South Knoxville, Tenn. Tool Holder.—An object of the present invention is to provide a tool holder, designed particularly for holding thread cutting dies, taps and other tools, and adapted to permit the same to be quickly changed when desired. Another object of the invention is to enable the tool holder to be quickly arranged for advantageous operation in a corner or close to an obstruction where there is little room. It is also an object of the invention to arrange the parts, so that when the tool holder is operated, the means for detachably retaining the dies or other tools in the stock will not be subjected to any strain.

George Kelly, Hindsdale, Ills., and Mineral Point, Wisc. Mr. Kelly, who is a very prolific inventor, particularly in the line of means for utilizing waste products, has obtained a series of patents on electrical insulating, fire and waterproof compositions and a novel cement or cementitious binder.

The first patent, which covers a material now being placed on the market, and known as Lith, consists of an insulating board, tile or slab composed of thoroughly commingled mineral wool and flax fibre. In producing the article, a wet body of flax fibre is stirred in with mineral wool until the two are thoroughly commingled, the stirring action being stopped prior to the pulping of the same, after which the mixture is formed into a board, tile, or slab.

Another patent covers the process of manufacturing insulating articles from waste newspapers sheets, and it also covers the article itself. The sheets are impregnated with a binder that frees the inks in said sheets, and afterwards the sheets are vulcanized together in the form of a slab or board.

A modification of this idea is covered by another patent, in which the printed paper stock, such as old newspaper, is first moistened or coated by brushing or dampening it with a solution of borax and water, after which a binding agent composed of liquid glass alone, or liquid glass including sulphur and rubber, is employed.

An excellent article for electrical insulating material has also been produced by Mr. Kelly, the same consisting of a combination of liquid glass, gum and mineral wool, vulcanized. The gum is preferably that known to the trade as pontianak, though other vegetable gums may be successfully employed.

Still another composition patented by Mr. Kelly and somewhat along the same lines as the above, consists of a mixture of gilsonite and liquid glass. This produces a fire and water proof composition, particularly useful in covering steam or hot water pipes and the like. It may also be employed as a binder for insulating purposes.

Mr. Kelly has also patented an insulating material, in which waste printed paper is pulped with a vulcanizing agent that includes rubber dissolved in liquid glass. This pulp and saturated material is pressed and vulcanized, producing a highly efficient insulating article.

In the manufacture of zinc oxide, electric chutes are employed, through which the condensed oxide is passed. These chutes soon become unfitted for use, and the old material is discarded. As they are thoroughly saturated with oxide, Mr. Kelly discovered that the material with the employment of other inexpensive ingredients can be made into a high grade insulating material at small cost, and therefore he has patented both the process and the article. He incorporates rubber and sulphur with the discarded material, and vulcanizes the composition, producing a high grade insulator which may be employed for various purposes.

In another patent there is disclosed a composition consisting of substantially equal parts of coal tar and liquid glass, the two being so combined that they produce a water proof and fire proof composition that can be employed for coating substances, and is peculiarly useful as a cement in cold storage work.

Mr. Kelly has obtained two patents on a glue or binder. The first patent covers a composition consisting of substantially five per cent of elastic vegetable gum, preferably pontianak and ninety-five per cent of liquid glass. The peculiarity of this combination resides in the fact that the liquid glass serves as a solvent for the gum.

The other patent covers a glue or binder composed of liquid glass, sulphur, rubber and white lead.

Thomas Cronin, Butler, Ohio. Nut Lock.—The patent covers a simple device that will efficiently and positively hold a nut against retrograde or loosening movement, but will permit it to be tightened at any time. The nut has a toothed outer face engaged by the corresponding face of a holding device, slidably mounted on the bolt and urged inwardly by a spring, the spring being housed within a casing fastened to the bolt.

Walter S. Van Emon, Selma, Cal. Punch.–Mr. Van Emon has produced a structure wherein removable punches of an exceedingly simple nature are employed, the punches being securely braced and held while in place, but being readily removable and replaceable. In connection with them there is employed novel means for stripping from the punches the material punched.

Galt M. Melven, Louisville, Ky. Hose Reel.—The device is particularly intended for garden hose, and consists of a frame, one member of which constitutes the axle for the ground wheels. In this frame is journaled a novel drum that is tapered, and is provided with means for securely holding the hose and nozzle in place without injuring or flattening the former.

Robert F. Lindsay, Greenville, S. C. Valve Protector.—The principal object in this case has been to provide a novel protector for rubber valves, which will eliminate the wearing of the valve by the spring and guide stud, and will also produce an elongated bearing for the stud in order to procure an easier action for the valve. Mr. Lindsay has assigned one-half of his invention to J. M. Hogan, of Greenville, S. C.

Thomas Croston, Hoquiam, Wisc. Rotary Engine.—This device is a comparatively simple structure in which but few movable parts or elements are employed, and said parts or elements are so constructed that notwithstanding the wear, steam or motive fluid tight joints are always maintained, while steam expansion is also secured with a consequent reduction in the amount of steam necessary for operation.

Luther A. Lohr, Timberville, Va. Speed Varying Apparatus. — The primary object of this invention resides in the construction of an expansible pulley in which there is no end thrust against any stationary part, thus obviating the necessity of the usual stationary thrust bearing. In connection with the above, simple means are provided for expanding and contracting the pulley, the arrangement being such that the friction of the parts due to their relative movements is reduced to a minimum.

John Betz and Jacob and Henry Wampach, Jordan, Minn. Wire Twisting Implement.—These inventors have produced an exceedingly simple implement for attaching staywires to the line wires of a fence, though it is not limited to this use. The device can be readily applied to the line wires and will properly hold the same in position until the tie has been made. The implement moreover is made up of elements that are very simple and are not liable to become deranged.

James J. Potter, Staunton, Va. Nut Lock.—The nut lock covered by this patent comprises a bolt having a threaded end and a transverse socket in the same, the nut screwed upon the bolt being provided with recessed seats in its outer side. The locking device comprises a doubled spring, the main body of which is arranged at one side of the bolt, one arm of the spring being longer than the other and detatchably fitting in the bolt socket, the other arm terminating short of the bolt and having a peculiar configuration that includes an offset free terminal detachably engaging in the sockets of the nut.

Rudolph A. Bostelman, Nashville, Tenn. Machine Cover.—This device is particularly intended for typewriting and other machines of an analogous nature, as for instance adding or computing machines. It consists of a casing comprising hingedly connected sections, and a support for the machine slidably mounted in the casing and normally locked against movement therein. The locking mechanism is so arranged that when the cover is open, the support is automatically unlocked and moves into the outer portion of the casing to expose the machine.

Henry O. Sparks, Shelbina, Mo. Two patents.—The first patent relates to an improved means for either loading or unloading material of any character to or from vehicles, or for excavating or other analogous purposes. The invention comprises a scoop having a bail pivotally connected thereto, and a locking means for holding the scoop and bail against relative movement; said locking means being pivoted at one end to the bail and engaging the rear wall of the scoop at the other end. This locking means is pivoted in the center, and is provided at the wall-engaging end with an upstanding stem to which is connected a cable, and a downwardly extending spur which engages the wall of the scoop. After the scoop has been loaded, it is elevated to the position desired by suitable means connected to the bail. When it is desired to dump the material from the scoop, the operator pulls on the rope or cable which is connected to the upstanding stem, when the scoop will be unlocked and the material automatically dumped.

The second patent relates to a simple means for quickly unloading vehicles, and which can be transported from place to place as desired. The invention comprises a derrick having standards spaced sufficiently apart to permit the entrance of a wagon. The wagon body is provided with a longitudinal and upstanding bail which is pivoted to projecting bolts located at the opposite ends and at the bottom of the body. Pivoted locking means for holding the body and bail against movement are provided at either end of the bail and are adapted to engage the upper edge of one side of the body. Hoisting cables, which are connected to the bail at either end, extend upwardly to the top of the framework where they pass through pulleys, and thence downwardly to the bottom where they again pass through pulleys. They are then united and connected to a whiffletree or the like. Draft animals are hitched to the whiffletree, and as they are driven away from the derrick, the body of the wagon is elevated by the cables. At a position midway between the top and bottom of the derrick, a chute is arranged, and as the wagon body passes, a trip is automatically operated which releases the pivoted locking means, and the wagon body is tilted, thereby discharging the material over the chute and into a storage bin or other receptacle.

Charles N. Hiner, Staunton, Va. Shade Roller.—This invention is an improvement on the clutch employed at the ends of shade rollers for the purpose of maintaining the tension of the spring. The clutches heretofore used have consisted of a gravity pawl, and as everyone knows, the pawl frequently is thrown out of engagement, causing the spring to unwind itself. The object of the present device is to provide a ball clutch to take the place of the gravity pawl. The invention is a simple one and consists of a single ball operating in an angularly disposed recess, and adapted to engage with a squared portion of the spring-journal of the shade roller. The device operates effectively, whether the shade is arranged in a vertical, horizontal, or inclined position.

Dio L. Walls, Kansas City, Mo. Meat Hook.—An object of this invention is to provide a meat hook designed particularly for hanging hams and other small meats in smoke houses or apartments and other places, and adapted to keep such meats cleaner and hold them safer than when suspended from a string, and capable also of effectually preventing the meats from falling and becoming burned or ruined, as is often the case when strings are employed. Another object of the invention is to provide a device adapted to increase the capacity of a meat rack, and to enable a greater quantity of meat to be hung on a rack than when strings are employed for hanging the meat.

Reginald R. Jones, Atlanta, Ga. Plow Fender.—This invention has for its object to provide an adjustable plow fender, adapted to be moved longitudinally of a beam and laterally with relation to the plow to space it the desired distance from the same, and to permit any desired amount of soil to pass beneath it to the plants under cultivation. Another object of the invention is to provide a plow fender, which, when set, will be adapted to permit a sufficient amount of soil to pass beneath it for covering up the grass, and which will also be capable of working the clods back to the center of the furrow.

NEW PATENTS FOR SALE.

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FOR SALE—Patent No. 900,843, dated Octoher 6, 1908. Horse detacher for runaway horses. Holdbacks and traces released at same time in two seconds. Address, J. R. Claxton, Box 60, Doon, Iowa. mar

FOR SALE—Patent No. 896,578. Nut locking device for rail joints. Will sell outright or to each individual railroad, or will sell on a royalty; also to manufacturers. Address, Richard Richards, Albia, Iowa. mar

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FOR SALE—Patent No. 898,287, dated Sept. 8, 1908. Steel Railway Tie. By comhination a new device for the railway and railroad man and manufacturers who are ready to consider a good thing for the future. Address, A. O. Thunhorg, Webster, Burnette Co., Wisc. mar

FOR SALE—U. S. Patent No. 898,820, dated Septemher 15, 1908. Stone Dressing Machine. Will cut two sides of stone at one operation without turning stone over. No chips in the way. Will not chip or stun stone. For particulars address, J C. Armstrong, Newkirk, Okla. mar

FOR SALE—Power Wheel No dam. Works regardless of frost or flood. For mills. dynamos, or irrigation. No. 107,660 Canadian, No. 896,867 U. S. A., patented August 25, 1908. Address, W. P. Spooner, Carievale, Sask., Canada. mar

FOR SALE—Patent No. 901,917, outright. A very valuahle and useful crib made of wood. Can be manufactured very cheap. Address, Theodore Kreisel, Warrenton, Va. mar

FOR SALE—Patented 903,719, dated Nov. 10, 1908. Danger Signal for Automobiles. Applied to the rear of automobiles to prevent rear end oollisions. Has utility in other directions. Address, Oscar Herrmann, No. 65 Central Park West, New York City. mar

FOR SALE or royalty—U. S. and Canadian patents No. 869,134. Collapsible Creates. Made of wood and metal. All parts are permanently connected; has locking ears. Can he quickly set up, or folded. This is the invention you want to revolutionize the create business. Can be used for all kinds of fruits, I will sell outright or state rights. Canadian patent at your own price, make me an offer. Write, Perry E. Boyd, Canton, Ga.

FOR SALE—U. S. Patent No. 882,396, dated March 17, 1908. Lantern Holder. Address, C. W. Leaning, Lock Box 3, Yankton, S. Dakota. mar

FOR SALE — Patent No. 891,052, dated June 16, 1908. Non-Refillable Bottle. For sale outright or royalty basis. Very simple and effective. For full particulars address, H. F. Erfman, Miamisburg, Ohio. feh

FOR SALE—Patent No. 712,173, dated October 28, 1902. A Non-Refillable Bottle. Address, Matthew M. Beam, Oldforge, Pa. feb

FOR SALE—Patent No. 893,992, dated July 21, 1908. An all around level; pitch, plumb, or any inclination. Cheap for cash. Address, Fuessel Bros., Box 85, Hicksville, N. Y. feb

FOR SALE—Patent Nos. 886,283, 898,807, and 891,647. This will build a complete gasolene engine. Will sell outright or in any way the purchaser desires. Address, Wm. L. Wayrynen, L. Box W., Norden, S. Dak. feb

FOR SALE—Patent No. 899,367, dated Sept. 22, 1908. Foot Arches. Can adjust to any foot with comfort to wearer. Will sell outright, state rights or royalty, or take partner with capital to manufacture. Address, F. J. Winchell. Box 39, Lynn, Mass. feb

FOR SALE — Patent No. 892,794. Improved Guard Attachment for Sewing Machines. Price $2500. Only guard which entirely shields fabric from driving mechanism of machine. Adjusted to any high-arm make. Cost of manufacturing 10 cents each. An easy seller at $2.00. Address, Miss E. Bailey, Fordoche, La. feh

FOR SALE—Patent No. 898,328, dated Sept. 8, 1908. Mechanical Movement. May he used as a gig drill; a coal auger; mining drill; and for automohile shaft. Patent No, 898,329, dated Septemher 8, 1908. Automatic Hook. Quickly releases the load without letting out the slack; will be found helpful both in shop, and in releasing life boat from the falls in time of storm. Cash or royalty. Address, C. J. Coulter, Longmont, Colorado. feb

FOR SALE or on Royalty—U. S. Patent No. 896,095; a bottle with a detachable strip of glass attached to lower end to form seal over mouth of bottle. Strip to contain all blown in names of letters or marks, by which bottle can be used for fraudulent purposes. Address, H. E. Erwin, Hazel, Kentucky. feb

FOR SALE—U. S. Patent No. 897,894. Out-Trapping Fly Escape Screen, which will trap all the flies in a room, and will do away with all the fly poison and sticky paper. Can be manufactured for 10 or 15 cents apiece. Address, Henry A. Hanson, Grano, North Dakota. feb

FOR SALE—U. S. Patent No. 898,049, issued Septemher 8, 1908. Folding shipping case. Made of wood and fibre board. Strong, light, and convenient. Can be used several times. Testimonials from manufacturers of boots and shoes and other commodities, who have used it. Big profits. Address, Malcolm Hutchinson, Muskegon, Mich. jan

FOR SALE—Patent No. 894,948, dated August 4, 1908. Broad-cast Distributor. Distrihutes evenly, saving from 10 to 25 per cent in seed. Prevents grain from striking hlock which does away with seed bouncing to one side, causing thick streaks. Will sell outright or on royalty basis. Address, V. G. Guthrie, Box 321, Winters, Yolo County, California. jan

FOR SALE—Patent No. 896,073, dated August 18, 1908. Rachet Wrench. Handy device for mechanics and farmers. Will sell outright. Correspondence solicited. Address, Theodore Atzenweiler, R. F. D. No. 1, Huron, Kansas. feh

FOR SALE—Patent No. 893,501, dated July 14, 1908. Butter Mold. Will sell reasonably at once. Address, Elmi Huber, Ingalls, Ind. jan

FOR SALE—Patent No. 894,953, dated August 4, 1908, outright or state rights. A measure filled and emptied without handling. Address, Dave Howe, Upson, Wisc. jan

FOR SALE—Patent No. 797,887. Pail Cooler. For cash or cash and royalty. Address, C. F. Dibble, Rochester, Minn. jan

FOR SALE—Patent No. 893,183, dated July 14, 1908. Drenching Bottle. Something new and very useful. A great necessity wherever cattle of any kind are kept. Address, Mrs. S. A. Meddaugh, North White Lake, Sull. Co., New York. jan

FOR SALE — Patent No. 895,358. Manure Spreader. Works without an apron. Best, safest and easiest draft. Will sell outright or part cash and royalty. Address, A. A. Fokken, Raymond, S. Dakota. jan

FOR SALE—Patent No. 886,592. A package binder. A money maker. Reason for selling is I have other hig inventions that I am anxious to prosecute work on. Address, Dr. W. E. Fricke, Sumpter, Oregon. jan

FOR SALE—Patent No. 892,992, July 14, 1908. Road scraper, which is peculiarly designed so as to automatically return to an upright position after having been dumped. Address, F. Heyer, Hubbard, Texas. jan

FOR SALE—Patent No. 864,692, dated August 27, 1907. End gates for wagon boxes. Will sell outright, or on royalty. Want correspondence with wagon manufacturers. Address, Arthur Roberts, Damar, Kansas. jan

FOR SALE or royalty—Animal toys made from card board or paper material. Cheaply manufactured. Amusing and instructive. Would be great sellers. Address, W. T. Wood, Nashville, Tenn. jan

FOR SALE—Seven new patents—hrooders or incubators; apparatus for cotton spinning; funnels for filling bottles; ring knot twine cutter; also British patents. Address, John H. Turcotte, 69 Union St., Springfield, Mass. jan

FOR SALE—Patent No. 886,243, dated April 28, 1908. A washing machine stove that rubs and also boils the cloths in the same vessel. Will sell any way to suit purchaser. Address, M. A. Patten, Milltown, Ga. jan

FOR SALE—Patent No. 782,373, dated Feb. 14, 1905. Stalk Cutter. Designed for cutting corn for the silo. Desire to sell outright. Address, George W. Whitcomh, Duff, Nebr. jan

FOR SALE—Patent No. 889,836, dated June 2, 1908. Cow Tail Holder. Practical. Cost to manufacture about six cents. Everybody that milks a cow can use one twice a day. Fifteen million milkers in this country. Price cash $10,000. Address at once, Loren G. Webb, Fort Atkinson, Wisc. jan

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FOR SALE—U. S Patent No. 861,872, dated July 30, 1907. Ventilator. Can be used on board of ships as well as on private or public huildings. Address, Roderick MacDonald, Fletcher St., Glace Bay, N. S., Canada. feh

FOR SALE or on Royalty—U. S. Patent No, 887,742, issued May 12, 1908. Set Saw Gauge, also Canadian patent on same. Address, J. S. Scott, P. O. Box 372, Fredericton, N. B. Canada. feb

FOR SALE—Package Tie, U. S. Patent No. 896,472, and Canadian Patent No. 113,775; English patent pending. For sample and information write, Dr. E. L. Sharpe, Pleasanton, Texas. feb

FOR SALE—Patent No. 896,534. Improved Nut Lock. The best nut lock of the present age. for railroad or automobile work. Inventor, A. L. Hart, Box 866, Barnesville, Ohio. feb

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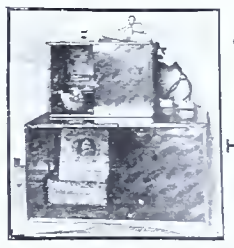
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WASHINGTON, D. C., JANUARY 1, 1909.

Report of the Commissioner of Patents.

The report of the Commissioner of Patents for the fiscal year ended June 30, 1908, which has recently been published, deals mainly with certain changes in the rules of practice, and with economies in the organization and management of the Office which tend to facilitate work. The receipts show the usual increase, the total being $1,870,000 in round numbers, with a surplus of $266,000 over the expenditures. There were 34,000 grants of patents, or a little more than half of the number that were applied for—the applications amounting to about 60,000. There has been a notable decrease in trademark registration, the number issued this year being less by 2,600 than in the previous year. The Commissioner makes the usual appeal for more spacious accommodation. The additional room assigned during the year, he says, has resulted in a vast improvement in the facilities for transacting the business of the Bureau; but as the volume of work grows so uniformly from year to year, the erection of an entirely new building will soon be imperative. To quote from the report:

"The net surplus of all years of receipts over expenditures which have been covered into the Treasury up to June 30, 1908, shows a grand total of $6,972,070.38. Nearly this whole sum has been paid by the inventors of the country, and inasmuch as they have paid the total expenses for the maintenance of the Patent Office it is but fair to say that they are entitled to have a suitable building provided in which their business can be transacted in a prompt and efficient manner. The cost of this building and ground could be entirely paid for out of this surplus, and I most earnestly urge that Congress be asked to make provision for an adequate building for the use of the United States Patent Office. Permit me to say in connection with this recommendation that the patent offices of Great Britain and Germany have outgrown their former building accommodations, and each of those countries has erected new buildings which are vastly superior in every respect to the one that now houses the United States Patent Office. A bill was introduced in the Senate at the last session of Congress providing for a new building for the Patent Office, and I most strongly urge that Congress be asked at the forthcoming session to pass that bill or a similar one, for the reason that before the time a proper building could be erected and ready for occupancy it will be very badly needed."

Recommendations for increase of force and salaries are also renewed. The aid granted by Congress has been of benefit, but further action is needed. A number of fourth assistant examiners should be appointed, to form a force to classify patents and digest publications of scientific subjects relating to patents for the use of the examiners and of inventors. The report says:

"With a proper classification or digest of all patents of all nations and technical and scientific publications, the cost in salaries and numbers of examiners will be greatly reduced, and the search work in the examination of applications for patents will be reduced to a minimum, and the facilities for making validity and other searches on the part of manufacturers, inventors, and attorneys vastly improved. This system of classification is imperative, owing to the fact that the United States has issued 900,000 patents to date, and the Office, in addition to that number, has 1,000,135 foreign patents. In making searches the Examiners are required to search both the United States and foreign patents and works in the scientific library, which consumes, under the present management of classes, much valuable time that would be thus in a great degree obviated. I have recently had occasion to inspect the patent offices of other leading nations, and I find the classification systems much more perfect than the one existing in our own Office."

It is of interest to note that the models which have for years been stored in a rented building, have now been sorted out, those of historical value or of possible benefit to patentees having been selected to be deposited in the New National Museum, and the others having been sold. Additional gains in efficiency are the amendment to the statutes which allows three months after the period permitted for the inventor to pay the final fee, in which the Office may prepare the papers and issue the patent; and a change in the scale of fees established for assignments, which has been productive of a marked increase in the Office receipts. The Commissioner continues:

"On April 1 last a new scale of prices for copies of the drawings and specifications of patents became effective, the former class and subclass rates of 2 and 3 cents, respectively, being abolished and a uniform price of 5 cents established, this being the price at which single copies have been sold for several years. The former rates of 2 and 3 cents for copies of patents increased the work of the Office and entailed considerable correspondence when class and subclass orders accumulated so that they could not be promptly filled or certain patents in the class and subclass were exhausted. It is estimated that the average cost per copy of printed specifications and drawings of patents is between 4 and 5 cents, and there was no reason for continuing the sale of such copies at an actual loss. The time during which the new rate has been effective has been compared with the corresponding period of last year, and while there has been a decrease of 10 per cent in the number of copies ordered, there has been an increase of 5 per cent in the revenues therefrom. Comparatively, this would mean an increase of revenue of the Office from this source of $15,000 per year."

As to the changes in the rules of practice, the most important one is noted in another column. The rule relating to attorneys practicing before the Office has been amended so that persons may be admitted who are attorneys in good standing in any court of record in the United States; and also any person not an attorney, who is a citizen of this country, and who shall file proof that he is of good moral character, and possessed of the necessary legal and technical qualifications to enable him to render applicants for patents valuable service. In some foreign countries, only subjects are permitted to practice before the patent offices, which requirement prevented such action on the part of a citizen of the United States. It is now provided that foreign patent attorneys shall not practice here, unless their country grants the same reciprocal rights to Americans. There are also new rules in regard to disbarment. Under the old system, a practitioner could be disbarred only for "gross misconduct;" which was held to mean the commission of fraud or the misapplication of fees in the prosecution of an application. The Commissioner now has power to exclude from further practice "anyone shown to be incompetent, disreputable, or who refuses to comply with the rules of the Office, or who shall with intent to defraud or in any manner deceive, mislead or threaten any claimant by word, circular, letter or advertisement, or who guarantees the successful prosecution of any application for patent." It will be seen that this affords much broader jurisdiction, and it is believed it will serve to check many existing abuses.

New British Patent Law.

An English patent lawyer who is traveling in the United States gave out during a visit to this city an interview in regard to the much discussed new British patent law. Americans seem to be under the impression, he said, that if a patent taken out in England is not worked within four years it stands revoked. That is a misconception, and one that has had the tendency to make the American inventor and investor fight shy of English patent rights and patent courts. It is true that the letter of the law requires such working, but in its actual operation more latitude is permitted. To quote this English authority:

"Although the new act of Parliament says that all patents granted in England must be worked within four years, it does not necessarily follow that the patent will be revoked if no work on it is done within that time. There are many patents which require a great length of time before they can be worked, and four years is too short for these. In this case it is merely necessary to inform the patent office of the fact, and extension is readily granted. I have yet to hear of a patent having been revoked because of its not having been put into working order in four years, as prescribed by act of Parliament."

American patents, the lawyer continued, are stronger and more thorough than those of England. Patents are most thoroughly examined in the United States, much more so than in England. There are of course more inventions patented in the United States than in Great Britain, and the inventive genius of the American, he added, seems to be better developed than that of his English cousin.

Changes in Application Papers.

Of the several amendments recently made to the rules of the Patent Office, none is of greater importance than that which has for its object to prevent changes in the papers of an application for patent after it has been filed in the Patent Office. Our readers may remember that some months ago this question came up before the Office, it having been discovered that the records had been tampered with. A sheet of description had been removed from the specification and another substituted, covering a description of certain features which were not included in the original application. The fraud might have remained undetected, bad it not been that some one observed that the new sheet of paper had a different watermark from the old one—a discovery worthy of Sherlock Holmes. The case was brought before the courts, and the examiner involved admitted his guilt, and is now serving a term in prison. The applicant, Heany, is still on trial. The necessity of preventing a repetition of such misdemeanors was at once perceived, and a new rule formulated. It had long been the provision of the rule for the application papers, when the oath is taken before an officer in a foreign country, to be attached together and a ribbon passed through all the sheets of the application and the ends of the ribbon to be caught by a seal; or else each sheet was to be impressed with a seal. Under the new rule, the provision is applicable to all applications filed in the Office, whether the oath is taken abroad or in the United States. If the officer before whom the oath is taken has no seal, he must place his initials on every sheet. It is thought that this provision will prevent any alterations in the application papers after they have been filed.

Patentees Defrauded.

Another scheme to deceive inventors has been recently unearthed by the Postoffice Department. There are few more fertile fields for the activity of fraudulent concerns than in the pretended selling of patents, and inventors have often been warned of this danger. The latest plan, however, has at least the merit of novelty, and as it appealed to one of the strongest of human instincts—the love of gambling in one form or another—it may be said to have won distinction in its own peculiar province. Two firms were ostensibly established in Ohio—the American Real Estate and Finance Company of Massillon, and the United States Patent Sales Company of Youngstown—but as a matter of fact, neither had any actual existence, and both were under the same management. The latter company conducted business along the good old lines, writing to all patentees offering to sell their inventions for the very moderate fee of from $2 to $15. It is needless to add that a number of inventors paid the fee, but heard nothing more from the company. But to inventors who did not swallow this bait, another scheme was presented. A year's option on the patent was requested, payment to be made in the stock of another company—a company which existed only in the imagination of the manager. Since mankind loves to be deluded, a great many victims bought this worthless stock, cheerfully paying the agent $10 for his services. It is pleasant to record that the operations of these mythical concerns have been brought to an abrupt stop by a fraud order issued by the Postmaster General.

Trusts and Invention.

With all that has been said and written about the throttling of industries by trusts, there is one direction in which their influence, although perhaps as harmful as in any other, has passed relatively unnoticed by the public. This is in the development of inventions. The tendency to combine the chief types of a certain machine—as typewriters, bicycles, or plows, for instance—into one great associaton, has a retarding effect upon individual enterprise. The huge industrial monopolies employ men whose business it is to invent all the improvements their brains can conceive of, in that particular line. They also employ patent attorneys to watch the field of invention, and to endeavor to invalidate patents that might rival their own devices, or to acquire the rights on terms dictated by themselves. The Examiners of the Patent Office have a high reputation—and justly so—for probity of character and the faithful performance of their duty. As a class, they are above suspicion of collusion with moneyed interests, and some of the latter have found this fact to their cost. There are ways, it is true, in which the might of wealth can be exerted even here, but it is chiefly in the development of patents after they have passed beyond the jurisdiction of the Office, that inventive genius finds itself hampered by the all-powerful influence of the trusts.

Floors Rented by the Acre.

The gigantic structures for office purposes built in this country during the last decade, dwarf into insignificance the masses of stone reared by the ancient Egyptians for the tombs of their kings, and the stately edifices with which the religious ardor of the Middle Ages adorned the cities of Europe. In the day of Macauley's New Zealander, it may well be that the piles of architecture in our cities will give pause to the touring Patagonian. Civilizations of that period will endeavor to imagine what manner of men occupied these fastnesses, these huge hives of steel and concrete. Each building is loftier than the last; there seems to be no limit to the aspirations of our sky scrapers. But it has been left for the great railway terminal of the Hudson and Manhattan Company, in New York, to be so enormous in its other dimensions, that floor space has actually to be rented by the acre.

This building, although the biggest in the world, is by no means as high as many of its companion giants in New York. It is only 22 stories in height, which, in these days when forty stories awaken no surprise, and 62 stories are planned, is a negligable altitude. But it covers several city blocks, and includes over 18,000,000 square feet of floor space—the equivalent of 27 acres. Those who can grasp the significance of figures will marvel over the fact that sixteen million brick, 75,000,000 pounds of concrete and 25,000 tons of steel were consumed in its construction. There are 16 miles of plumbing within its walls, 29 miles of steam heating pipe and 95 miles of conduit. It took 113 miles of electric wiring to supply the rooms, and 30,000 electric light bulbs have been placed. There are 39 elevators, and 4,200 rooms in the monstrous structure. The whole stands over a cofferdam, a waterproof pit 420 by 180 feet in size, enclosed in concrete walls which extend down to solid rock nearly a hundred feet below the street level. This pit is a railway station and receives the railways that run through the tunnels to Jersey City and bring into New York the trains of the Pennsylvania, the Erie and the Lackawanna roads, the passengers from the steamships landing in Hoboken and Jersey City, and the commuters who live along 500 miles of trolley roads in northern New Jersey.

The first floor under the surface contains the waiting rooms, including a great concourse where passengers can buy tickets, check baggage, etc. Surrounding this enormous room is a department store, where passengers and suburbanites will be able to do their marketing and shopping without going out of doors, There are telegraph offices, barber shops, news stands, fruit and flower booths, confectionery shops, a government postoffice, restaurants and cafes, telephone booths, a parcel room, cigar stores, offices where railway and steamship tickets to all parts of the world can be bought. and shops for the sale of all the necessities of life.

It is estimated that when all the upper office rooms are taken, 10,000 persons will be accommodated under the roof, and that over five hundred thousand people will enter the building every day. The force of employes, including engineers, firemen, electricians, elevator boys and janitors, numbers 150.

As already intimated, floor space in the terminal is rented by the acre, and it shares this unique distinction with no other building in the world. The Erie Railway Company has taken two acres of floor room, the U. S. Steel Corporation one and a half acres, the United States Government has rented an acre for a branch postoffice, and the General Electrical Company and the American Locomotive Company have each taken a half acre. The highest rent ever paid for business purposes is given by the cigar trust for a corner room on the ground floor—$40 per square foot, or $18,000 a year for a room 19 by 22 feet in size. Land and building together cost $15,000,000, but there is every indication that the investment will be a highly profitable one.

Prize for Method of Combating Gases.

In probably no country are there so many factories, in proportion to the area, as in Saxony. The traveler through this part of the German Empire is seldom out of sight of a tall chimney; and the damage to agriculture and to forests from the gases of such a multitude of industrial establishments is constantly more marked. So serious has the question become that the Ministry of Finance has offered prizes for effective methods of combating the evil. A prize of $2,400 will be given the inventor who can devise the best system of remedying the injury due to the presence of sulphurous acid and other acid vapors in factory smoke, and generally in the products of the combustion of bituminous coal. A further prize of $500 is to be awarded for the best compendium of literature on the subject.

Competitors are to submit their work before the end of the year 1909. The prize for a suitable device will be allotted after a test lasting two years. The inventor retains all property rights in his device. A prime condition is that it shall be of such a nature that ordinary, unskilled labor can use it with ease.

It has been found that these acid gases are more noxious to pines, firs, spruces, and similar conifers than to other classes of trees. It has also been established that plants suffer more when the air is foggy or humid. When it is raining, or when it is clear and dry, the injury is much less noticeable. As Saxony is a country of mist and excessive moisture, the atmospheric conditions are favorable to the destructive action of the acids. Devices in use in England for counteracting this action are based on two principles. The smoke issues from lofty chimneys, so that it is widely diffused in the upper strata of the air; or it is brought in contact with solutions capable of absorbing the greater part of the acid. Mixtures of limestone and water, or simply water, have been tried with some success. It is hoped a method can be devised which, in connection with the act of combustion itself, will prevent the escape of the gases.

Infusorial Earth, or Diatomite.

Diatoms, as every one knows, are tiny creatures which multiply very rapidly until they form a scum upon the surface of water in many parts of the world. They are rarely more than one hundredth of an inch in diameter, and often less. Their shells are composed of silica, and these are well known to the microscopist on account of their beauty. When the little creatures die the shells sink to the bottom of the water, where they form a kind of siliceous mud, and there are vast deposits of this material in various parts of the earth. This diatomite, or infusorial earth, is being used for a variety of purposes under the name of kieselguhr. It is a light, flour-like mass, dry to the touch: it absorbs water, cannot be melted or burned, and in ordinary temperatures resists chemical action.

Kieselguhr is extracted from the earth like clay, and dried, generally in the open air. Reducing, cleaning and mixing mills, similar to those employed for the manufacture of brick, are used. The applications of infusorial earth are extensive, and are constantly widening. Large amounts are employed in the manufacture of dynamite, where the remarkable absorbent properties of the material come into play. It is also used in the preparation of artificial fertilizers, especially in the absorption of liquid manures. There is an extended use of the earth for rapid filtration purposes, as well as for covering steam pipes and boilers, lining refrigerators, and filling the walls of fireproof safes. For such purposes it has an advantage over asbestos in the matter of price and also in weight. It can be utilized for artificial stone, slabs, glazing for tiles, and various cements. It finds application as filling material for soap, paints, polishing powders, filtering material for chemicals, Swedish matches, papier mache, and a variety of other objects. It occurs in great quantities in Prussia, in parts of Scotland and Ireland, in the United States and Canada. American diatomite is harder and more brittle than the German, and the Canadian has an entirely different structure. As new uses are being found almost daily for this adaptable material, a much greater demand will probably soon result.

Electrocuting Flies.

A device for killing flies by electricity is easily made, and works admirably. The wires running in one direction in a screen are connected with one terminal of a small dynamo and the cross wires are connected with the other terminal. The two sets are insulated from each other. As soon as the legs of the fly come in contact with the wires of the screen, the insect stiffens and dies instantly and painlessly.

A CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE. This keeps inventors and manufacturers posted in the art in which they are most interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy; twenty copies $1.50.—Please give correct data in ordering.—Address,

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Issued November 24, 1908.

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Canned goods, Apparatus for processing.....R. P. Polk
Car.....S. Otis. (Reissue.)
Car and other axles, for Journal-bearing.....J. E. Muhlfeld
Car and other axles, for Journal-bearing.....W. H. Mines et al
Car-coupling.....W. McConway
Car-coupling.....R. E. L. Janney et al
Car-door seal.....J. F. Wing. (Reissue.)
Car-fender.....C. Kleymeier
Car indicator, Street-.....J. E. Anger
Car, Passenger-.....W. S. Twining
Car, Passenger-.....L. T. Pyott
Car pedestal, Mine-.....J. R. Roberts
Car, Push-.....G. C. Wartman
Car stake, Logging-.....J. R. Dodge
Car supplemental wheel, Motor-.....M. D. Stocking
Car trolley.....J. Kaufman
Car-underframe.....J. M. Ames
Cars and the like, Apparatus for indicating the level of petrol in the petrol-container of motor-.....F. Huttenlocher
Cars, Truck for replacing derailed street-.....E. E. Birch
Caramel-tray.....F. P. Vavra
Carburetor.....W. M. Carlin
Carbureter.....E. J. Thompson
Carburetor.....P. Spranger
Carbureter and mixer.....O. R. Hukle
Carrier system, Automatic, 2 pats..S. H. Libby
Cartridge-trimming machine.....H. J. Hurd
Casing-perforator.....L. E. Stephens
Cash-register.....W. R. Heinitz
Casting soil, water, and gas pipe direct from the blast-furnace in permanent molds.....E. A. Custer
Chain.....J. V. Costello
Chair and fan attachment, Rocking-.....J. Gavlak
Chimney and smoke-stack.....H. Corregan
Chuck.....D. A. Bruton
Churn.....T. N. Brown
Circuit-closing relay.....J. F. Webb, Jr.
Clamp, Rail-.....J. M. Vail
Clasp for purses and the like, Safety-.....W. McIlroy
Clock-case.....W. J. Walker
Clothes-drier.....H. W. Lamp
Clock with alarm and music attachment.....V. M. A. Bogaert
Closet flushing and ventilating means.....J. J. Shtuchka
Clothes-pin.....I. Barmore
Clutch.....J. C. and W. J. Pope
Coal-separator.....J. H. Walker
Coaster-brake.....P. W. Toohey
Cock, Stop-.....T. E. Dwyer
Coffee-pots, &c., Attachment for..T. R. Gracie
Coin-controlled gasometer.....W. J. Hill
Collar, Pyroxylin.....F. A. Gudger
Collar, Safety-.....L. Harlow
Concrete-building-block-molding machine.....C. W. De Armon et al
Concrete-column reinforcement..A. A. Clement
Concrete columns, Metal reinforcement for reinforced.....E. McClure
Concrete construction, Armored....E. Coignet
Concrete-construction reinforcing-bar.....J. V. Jenkins
Concrete construction, Tension-bar for.....G. S. Miles
Concrete constructions, &c., Device for.....G. S. Miles
Concrete drain-tile, Mold for forming.....S. L. Sheets
Conductor flexible suspension...L. Steinberger
Connector.....C. T. Crocker
Control apparatus for translating devices, Distance-.....F. Schattner
Control system.....G. H. Hill
Controlling device, Condition-.....J. I. Ayer
Copper from coagulated cellulose, Eliminating.....E. Crumière
Core-box.....E. B. Horne
Corset.....K. V. Tojetti
Cotton-gin, Roller.....W. L. Crowson
Cotton-warper.....J. M. Payne et al
Cover.....F. G. Lauster, Sr.
Cow-milker.....J. Ripczinske
Crank, Adjustable.....E. C. Drecoll
Cream-separator.....E. W. Bromall
Cross-tie, Railway.....F. N. and H. A. Drane
Crusher and pulverizer, 2 pats..M. F. Williams
Crusher and pulverizer hammer or beater.....M. F. Williams
Cuffs, &c., Machine for folding blanks for....G. J. Dormandy
Culvert.....J. F. White
Culvert.....J. H. Schlafly
Cup plug, Lubricator-.....A. McDonald
Curtain-fixture.....G. Jones
Curtain stretcher, Lace-.....P. J. De Vries
Cutting and raveling machine, Carpet.....W. P. Kirkpatrick
Cutting machine, Coal-.....G. Leichnam
Cylinder.....B. Trebilcock
Cylinder type, Adjustable lock of the.....H. G. Voight
Damper-regulator.....W. Roberts et al
Davit-operating device.....H. B. Firth
Dental broach and holder.....C. R. Powers
Dish-washing machine.....B. F. Singer et al
Disinfectant-distributer.....J. O. Walker
Display-case.....C. F. Kurz
Display-stand.....H. R. Cropp
Door-operating mechanism.....J. G. Bower
Door-operating mechanism..G. C. Cherbonnier
Doors, cupboards, &c., Lock for...H. J. Cowell
Draw-bar.....E. Rolin
Draw-bar.....W. Graham
Drill-rest, Adjustable.....J. F. Parker
Drum-controller.....H. J. Wigand
Dust-pan.....W. A. Babbitt et al
Dye and making same, Yellow-olive....E. Saul
Dyestuff and making same, Violet vat.....A. Groh
Ear-protector.....R. McWilliams
Egg and other beater.....H. P. Wells
Elastic webbing, Embossing.....H. H. Allison
Electric-current bathing-tub.....F. Braun
Electric-drill controller...W. O. Duntley et al
Electric float, Steam-power.....W. J. Pattosien
Electric heating device.....J. I. Ayer et al
Electric lighting device.....J. T. Fisk
Electric machines, Current-collecting apparatus for dynamo-.....J. E. Noeggerath
Electric-machine voltage-regulator, Dynamo-....G. S. Neeley
Electric-motor-control system..A. C. Eastwood
Electric-railway line-interrupter.....A. Thode
Electric signs, Electric-lamp receptacle for.....F. W. Ruby
Electric traction-elevator.....D. C. Suplee
Electric welding, 3 pats.....L. S. Lachman
Electric-welding rotary converter.....A. M. Hoffman
Electric-wire outlet-box.....J. Fountain, Jr.
Electrical conductor-support.....J. S. Allen
Electrical-distribution system....C. D. Haskins
Electrical-distribution system.....W. L. Bliss
Electrical interrupter.....H. M. Sutton et al
Electromagnet.....G. W. Henry
Ellipsograph.....C. Schreiber
Embroidering-frame.....N. B. Noble
Embroidering-machine.....R. Loeb
Emergency-brake.....F. B. Corey
End-gate, Wagon.....R. L. Templeman
Engine balance-valve, Steam-....F. J. Meanley
Engine governor, Marine-.....A. H. Zientarski
Engine starting mechanism, Internal-combustion-.....H. C. L. Holden et al
Engines, Carbureter for internal-combustion..G. Enrico
Engines, Device for reversing the direction of rotation of internal-combustion, 2 pats.....L. Le Pontois
Engines, Means for connecting and disconnecting.....S. S. Smith
Envelop, 2 pats.....W. J. Bernthold
Exercising-machine.....O. K. Sletto
Explosive-motor, Compound.....S. A. Reeve
Explosives, Apparatus for distilling off and recovering the solvent used in the manufacture of.....W. Nikolsky
Eyeleting-machine.....P. R. Glass et al
Fabric, Textile.....G. P. Schlemmer
Fan, Ceiling-.....F. P. McBerty
Fabrics, Manufacture of multicolored.....M. Böhler
Fanning-mill.....W. Milbrath
Faucet.....C. J. Paulson
Feed-capping machine, Automatic-.....G. Kirkegaard
Fence.....G. A. Masters
Fertilizer-distributer.....C. C. Morgan
File-cases, Device for handling.....J. B. Nicholson et al
File, Combined temporary binder and arch-.....P. MacGregor
Filter.....W. L. Imlay
Filter-plate lock.....W. J. Ruff
Filter, Water-.....H. Brunner
Finishing machine, Silk-thread-.....E. Pohl
Fire-alarm-box alarm device.....J. B. Nicholson et al
Fire-alarm, burglar-alarm, and telephone system, Automatic.....G. F. Milliken et al
Fire-alarm circuits, Circuit-closer for.....W. W. Katterjohn
Firearm, Automatic.....C. L. H. Prinke
Firearm sighting apparatus.....M. Klingler
Fireproof structure....A. L. A. Himmelwright
Floor-pocket receptacle and plug..F. J. Russel
Floor-scraper.....J. Miotke
Flooring, Device for laying parquet..F. Wellan
Fly-catcher.....C. A. Arents
Fly-catcher.....C. A. Arents. (Reissue.)
Fruit-box.....W. R. Stokely
Fuel-feed, Automatic.....E. G. Ofeldt
Furnace muffle, Electric-..J. F. Hammond et al
Furnaces, Charging blast-.....H. D. Williams et al
Furnaces, Means for attaching stirring-arms to shafts in mechanical roasting-...W. Troeller
Furniture support, Swinging-....W. H. Virgie
Fuse attachment, Safety-.....W. J. Boemper
Fuse-plug, Electrical.....H. E. Bradley
Gang-machine.....A. O. Thomas
Garment, Combined.....M. Tartikoff
Gas-box attachment.....F. E. Brickner
Gas-burner.....H. A. Giller
Gas cut-off.....J. F. Wells
Gas-engine.....E. A. Nelson
Gas-producer-feeding apparatus.....J. A. Swindell
Gas-producer-feeding mechanism.....W. B. Hughes
Gate.....E. J. A. Rice
Gate.....G. J. Gintert
Gate opening and closing device....S. P. King
Gear-cutting-machine cutter-head....E. J. Lees
Gearing.....E. B. Zook
Gearing.....J. J. Bowes, Jr.
Gearing, Awning-.....E. Rosenberg
Glass case, Tourist's.....J. M. Faehrmann
Glass, Crate for sheet-.....H. O. Hemmick
Glass-molding apparatus, Automatic.....F. J. Mackin
Glassware, Manufacturing.....F. L. Arbogast
Go-cart, Folding.....R. G. Ledig
Gold from crushed ores, Apparatus for the extraction of.....T. E. Beaumont
Governor, Centrifugal.....H. C. Clay
Grain-scourer.....T. Grose
Grapple.....C. L. Simmons
Grinding-machine, Universal.....F. Stutzman
Grinding-mill.....W. R. Cunningham
Grinding-mill.....A. A. Warner
Gun, Air-.....W. J. Burrows
Gun chain rammer.....O. Knoch
Gun fluid-brake, Recoil-.....F. Stock
Gun, Trap-.....J. Ross
Gun trigger mechanism, Machine-.....K. Heinemann
Guns, Pneumatic recuperator for recoil-.....N. Koch
Hair-ribbon holder.....M. L. Schwab
Hame and trace connector..W. R. Brents et al
Hammer, Power-.....J. W. Keeley
Hand-bag.....T. R. Weidemann
Handle.....W. H. Kepple
Harmonica.....A. W. Anderson
Harness.....W. J. Holder
Harrow.....J. M. and W. J. Glick
Harrow attachment.....J. F. Brownlee
Hatchway.....E. Wold
Haulage system.....P. A. Degener
Heater.....J. C. Plank et al
Heating appliance.....W. B. Brind
Heating system, Vacuum.....J. L. Welshans
Hinge, Door-.....V. Kiple
Hinge, Gate-.....G. B. Hanlove
Hoisting mechanism.....C. G. Palmer
Holder.....C. C. Williams
Horse-detacher.....D. A. Brunett
Horse-detacher.....J. Worrell
Horse-releaser.....G. W. Morter
Horses and other animals, Safety-bit for.....G. Ciammaichella
Horse-rack.....H. Gibbs
Hose-supporter.....V. Price
Hub, spindle, and axle-arm.....W. E. Baxter
Hydrocarbon-burner.....E. J. Achée
Hydrocarbon-motor.....A. A. Low
Ice-cutting apparatus, Plate-.....P. F. Stein
Igniting device, Self-.....O. M. Müller
Incandescent illuminant.....O. M. Thowless
Incubator.....J. A. Britton
Incubator-heater.....H. E. Keller
Index drawer, Card-.....E. M. Olson
Indicating and recording instrument.....W. F. Howe
Ink-well.....J. I. Woodruff
Insulating material.....G. H. Rupley
Internal-combustion engine.....E. Rathbun
Internal-combustion engine.....J. Hutchings
Internal-combustion motor.....M. Berliet
Internal-combustion rotary engine.....H. Lee
Iron, Thill-.....F. A. Strodel
Ironing-board.....H. W. Vance
Jewelry component.....J. C. and J. A. Doran. (Reissue.)
Journal-box.....L. G. Woods
Key-holder.....J. F. Stewart
Keyboard, Auxiliary transposing-.....G. G. Scurfield
Ladder, Sectional.....H. M. Ackley
Lamp, Brazier's.....J. A. Shores
Lamp-burner.....A. L. Edwards
Lamp, Electric incandescent...F. W. Erickson
Lamp electrode, Arc-.....H. S. Hatfield et al
Lamp for stereopticons, &c., Arc-.....H. F. Patton
Lamp-reducer.....C. Wirt
Lamps, Shade-holder for incandescent.....J. Weber
Land-roller.....H. P. A. Andersen
Lather-rubber.....R. and R. W. Sampson
Leather-splitting machine, Flexible roll.....J. J. Stehling et al
Ledger-plate and knife-guard.....S. F. Martin
Leveler and scraper.....T. W. Clark
Lifting-jack.....S. B. Minnich
Lightning-rod.....G. R. Kress
Linen, Appliance for washing.....F. L. Bartelt
Liquid yeast mixtures for bread, Preparing.....W. J. Temple
Lock.....J. R. Fletcher
Lock.....S. Popky
Locomotive exhaust apparatus.....G. J. Hatz
Locomotives, Adjusting mechanism for the journal-boxes of.....J. Conlin
Log-turner.....C. D. Scott
Logging apparatus.....T. W. Tiley
Loom, Weft-replenishing.....N. Demers. (Reissue.)
Lubricator.....J. P. Johnson
Lubricator.....J. J. Costello, Jr.
Machine-support.....W. Wenzel
Mail-bag catching and delivering apparatus.....J. E. Boyle
Mail-bag support.....W. H. Tell
Mail-catcher.....W. D. Walton
Mail-delivery cabinet and heater, Combined rural-.....J. W. Walker
Match-box.....O. A. Garland
Match-box.....J. A. Edes
Match-box holder.....W. J. Jones
Match-safe.....J. E. Hill
Matrix and holder therefor.....W. E. Chalfant
Matrix corner-chamfering machine.....H. A. Reynolds
Matrix notch-chamfering machine.....H. A. Reynolds
Measuring instrument.....F. H. Pierpont
Measuring instrument, Combined.....W. R. Chynoweth
Measuring-rod.....H. Boeck
Metal nut, Wrought-.....F. A. Neider
Metal-working machine.....F. E. Bocorselski
Metals, Making homogeneous bodies from tantalum metal or other refractory.....W. von Bolton
Metallic compounds and producing carbids, Smelting.....E. F. Price
Mine-roof support.....F. C. Keighley
Mirrors and other articles of glass, Ornamentation of.....T. Archer
Mixer.....A. E. McNitt
Molding-flask sand-hook.....A. Kolvoord
Molding-press, Hydraulic.....P. Bonvillain. (Reissue.)
Motor-wheel, Cycle.....J. E. Périllard
Mud-guard.....W. D. Snowman
Multiply material, Apparatus for forming.....J. J. Hinde
Multispindle-machine.....G. O. Gridley
Music-leaf turner.....W. J. Thillen
Nailing-machine attachment...P. L. Billingsley
Necktie.....D. C. Mitchell
Needle, Vaccinating-.....C. H. Higgins
Net.....D. H. Saunders
Newspaper-holding device.....J. K. Morris
Nozzle, Spray-.....A. S. Washburn
Nozzle-tip.....W. E. Bideker
Nut-lock.....F. Matoushek
Nut-lock.....J. E. Dressler
Nut-lock.....D. J. Higginbotham
Nut-lock, Automatic.....J. T. Clark
Nut or pipe wrench.....D. Stewart
Nuts, Bleaching.....W. Hills, Jr.
Oar, Bow-facing.....C. H. Vessot et al
Ores, Treating metalliferous...F. R. Carpenter
Oven, Drying-.....C. P. Bascom
Packaging-machine.....R. B. Polk
Packing, Metallic.....G. D. Rollins
Pads, Composition of matter to be used in making copying-.....E. O. G. Winckler
Pail.....J. H. Berry et al
Paper-making-machine drive.....J. H. Wallace
Paper-music-sheet roller.....L. B. Doman
Pasteurizing and sterilizing apparatus.....C. E. Hinman
Pasteurizing apparatus.....A. A. Pindstofte
Petticoat.....E. G. Murray
Phonograph automatic stop attachment.....E. B. Hyatt
Phonograph-reproducer.....F. L. Dyer et al
Phonograph-reproducer.....F. D. Lewis
Phonograph-reproducer.....D. Holden
Phonograph-reproducer.....P. Weber
Photographic camera, Folding..F. A. Brownell
Pianoforte-action.....W. W. Wallace
Picker-stick check.....T. Boucher
Picture-hanging device.....G. A. Francis
Pin-board.....E. L. Besse
Pipe-coupling, Flexible.....J. Henderson
Planing-machine side-head joiner.....C. W. H. Blood et al
Planing-machines, boring-mills, and the like, Clamping mechanism for..G. H. Benzon, Jr.
Plate-casting machine, Stereotype-.....H. F. Bechman
Plate-making apparatus, Pattern-.....P. Bonvellain. (Reissue.)
Pliers.....C. Hiller
Plow.....T. M. Manning
Plow.....C. Marvin
Plow and sleigh, Combined snow-..N. A. Olsen
Plow, Wheeled.....W. E. Johnson
Pocket, Safety-.....J. Sanfason
Polishing-head.....F. Pieree
Poultry water and grain receptacle.....M. L. Weldon
Power-hammer.....J. Hamilton et al

Press folder, Cotton-....R. M. Jordan
Press for paper-making, Feltless wet-....F. M. Chapman
Pressure-gage, Differential...W. J. Crowell, Jr.
Printer's composing-stick....T. Draper
Printer's implement....W. N. Swain
Printer's quoin....C. L. Dingens
Printing apparatus, Electrical....M. T. Weston
Printing-telegraph receiver....J. Burry
Propelling-gear and other apparatus on shipboard from air used for facilitating the propulsion, Protecting....G. Quanonne
Pulley....E. W. Cunningham
Pulley....C. M. Swanson
Pulley, Adjustable guide-....E. Croasdale
Pump, Air-compressing....S. Dahlberg
Pump, Centrifugal....G. Hauft
Pump, Double-suction....F. W. Baines
Pump for mine-shafts....R. Heidecke et al
Pump, Hydraulic....J. W. Nelson
Pump, Pressure-....L. C. Trent
Radiator....C. E. Safford
Rail-bonds, Manufacture of....W. H. Williams
Rail-fastener....J. A. Widner
Rail-joint....B. Ohnimus
Rail-joint....J. F. Schonlau et al
Railway-alarm, Automatic....N. Lang
Railway, Overhead electric, 2 pats....F. M. Frederick
Railway safcty appliance....A. M. Jones
Railway-tie, Concrete....J. F. Weilep
Railway-tie, Metal resilient....G. Mackay
Razor....J. A. Reams. (Reissue.)
Razor frame, Safety-....B. Gallinek
Receptacle....M. A. Adams
Refrigerator....C. Tettenborn
Revolvers, pistols, or the like, Safety-lock for....J. Tambour
Riveting-machine....W. T. Sears
Road-roller scraper....C. F. Henn et al
Rock-crusher....J. R. Fogg
Rope-fastener....J. B. Anderson
Rope tie....O. Cooper
Rotary engine....C. A. Bender
Rotary engine....B. F. Hoard et al
Rotary switch....F. J. Russell
Rubber footwear....E. A. Saunders
Rubbing-post....J. W. Coffman
Sash-weight mold....S. Dyer
Sash-weights, Molding....C. J. P. Hoehn et al
Sash, Window-....R. C. Fingal et al
Sawhorse....O. Poitras
Sawmill-dog....A. V. Wineman
Sawmill power set-works....D. C. Prescott
Scoop, Ash-....R. B. Clement
Scoop-board....A. Lombardo
Screw-propeller....C. Steiger
Seal, Bottle-....C. Winter
Seal-lock....H. Elmblad
Semaphore mechanism, Elcctrically-operated....J. F. Webb, Jr.
Sewing-machine....F. English
Sewing machine, Bale or bag...A. von Hasperg
Sewing machines, Feed-point or awl for shoe-....E. E. Currier
Shade and curtain bracket, Combination....W. H. Bantly
Shade fixture, Adjustable window-....J. D. Perrott
Shade fixture, Window-....A. Holmes
Shade-holder....J. H. Dale
Shears-holder....H. L. Kocher
Sheet metal, Rolling....C. B. Cushwa
Ship, Aerial....F. Bollhorn
Shoe-display form....C. F. Partridge
Shoe heel and toe beating-up machine....J. O'Connell
Shoe-rack....W. Cartier
Shoe tree or form....S. M. Hamblin
Shuttle....S. Kendrick
Signal apparatus....E. B. Dailey
Signaling system....G. Babcock
Signaling system, Electric railway..Y. Burgess
Skate tire, Roller-....I. Wanta
Skirt-holder....H. H. West
Slicing-machine....W. M. Miller
Smoke and dust collector....W. F. Diem
Snap-fastener....W. B. H. Dowse
Soap and making soap....C. Ellis
Sole, Ventilating-....H. Otterstedt
Speed indicator and recorder....F. F. Uehling
Speed-indicator, Synchronous....A. E. Griffin
Spike....L. L. Sessagrant
Spoon, Cutting-....H. L. McCoy
Sprayer, Hand-....E. R. Richards
Stake, Supporting-....J. O. Ford
Stamp-affixing machine....T. C. Gilbert et al
Stamping machine, Box-....R. Schilling
Starting device....A. E. Nelson
Steam-heating system....C. T. Ammon
Stirring mechanism....J. J. Stehling
Stone, Artificial....S. W. Berglund
Stove burner, Gas-....J. T. Scollard
Street-number indicator for houses....A. Goldbard
Surgeon's-needle holder....A. F. Sether
Surgical appliance....M. R. Cutting
Suspender attachment....J. Hauser
Table-leaf support....W. H. Tritch et al
Tack-driver....D. A. Sawyers
Talking-machine sound-box....A. Fischer
Talking-machine sound-box....A. Junod
Tank seamless lining....J. M. Burr et al
Telegraph-repeater....L. B. Cecil
Telegraph system....S. D. Field
Telephone annunciator and jack...H. Tideman
Telephone system....H. G. Webster
Telephone system....F. W. Dunbar
Temperature-indicating instrument....A. N. Ozias
Temporary binder....H. H. Liscom
Thread-finishing machine, Silk-....D. H. Haywood
Tie-making machine, Wall-....J. H. Rau
Tile-molding apparatus, Glass-...E. D. Mooney
Tire-tightener....P. and M. J. Rau
Tires, Composition for preventing leakage of air through punctures in pneumatic....L. H. Rogers et al
Tobacco-pipe....J. Monsou
Tobacco-stripper....T. P. Ford
Tobacco substitute, Masticable....C. Ellis
Tool-case, Hand....C. Madeira
Tool-handle wedge....J. W. Hair
Tool-holder....C. E. Bown
Tool-holder....H. Vogel
Tool, Impact-, 3 pats....C. B. Richards
Tool, Pneumatic impact-....G. L. Badger
Tool, Punching-....T. McGrath
Tool, Staking-....F. R. Cunningham
Tool, Stone-working....L. W. Greve et al
Tooth, Artificial....F. D. Case
Toy....J. Lexow
Train-order signal....L. H. Van Zandt
Transfer....J. W. Hentz
Transom-operator....G. H. Lawrence
Trap....M. Engstrom
Trap....B. A. Martinson
Trench-digger carrier, 2 pats..F. R. Batchelder
Trolley and telegraph pole, Combination....J. Hackett
Trolley-wheels from jumping, Device to prevent....W. O. Lane
Truck, Car-....E. H. Benners
Truck, Transfer-....G. P. Baldwin
Tub trap, Rinse-....W. L. Koenig
Turn-table, Piano....J. J. Sullivan et al
Twine-holder....J. M. and R. E. Pinegar
Type-writing machine....E. E. Barney
Type-writing machine....W. C. Farnum
Type-writing machine....J. Felbel
Type-writing machine....H. W. Merritt
Type-writing machine....H. L. Wagner
Type-writing machine....J. Oppenheim
Type-writing machine, 3 pats...H. C. Ferguson
Type-writing machine....L. A. McKeever
Type-writing machine....H. H. Steele
Type-writing machine....J. C. McLaughlin
Umbrella-repairing device....E. H. Stoddard
Urinary apparatus....V. D'Incognito
Valve, Emergency-....O. Penn
Valve for hydrocarbon lighting systems....M. W. Pitner
Valve, Piston-....M. Christman et al
Valve stuffing-box, Engine-....J. J. MacMulkin
Vehicle....J. K. Kendrick
Vehicle cushioning device...A. Carpenter et al
Vehicle-gear....J. D. Weekes
Vehicle, Motor-....W. Y. Donahoe
Vehicle, Self-propelled....C. Richter
Vehicle transmission-gear, Motor-....H. T. Hansen
Vehicle trucks, Suspension of railway and tramway....E. Peckham
Vehicle-wheel....M. Joachimi, Sr.
Vending apparatus for cigarettes and the like, Coin-controlled....J. Sahlin
Vending-machine....R. J. Morrison
Ventilating device....J. W. Farley
Ventilator....H. Shlamowitz
Vibratory apparatus for ear treatment....E. Meyer
Wagon, Dumping-....A. Maxwell
Wall, Partition-....W. J. Perkins
Washing-machine tubs, Wringer box or tray for....W. H. Voss
Watch, Stem winding and setting....W. E. Porter
Water-closet bowl....C. H. Rollins
Water-elevator....A. Haas
Water-heater....L. D. Lovekin
Water-motor....J. P. and H. P. Shevlin
Water-supply system....J. T. Lemon
Watermobile....P. McDermott
Weed cutter and puller, Combined....H. S. Wimmer
Weighing-machine....T. S. B. Parnall
Welding-machine, Electric....W. M. Fulton
Wells, Grappling-bucket for cleaning....A. Burrows
Wheel grinder, Band-....P. A. Cazes
Wheel guard or fender....C. T. Moss
Wheels, Antifriction thrust-bearing for....W. J. Trevessick
Whip-snap fastener....P. E. Gold
Whirlpool, Artificial....W. W. Devore
Winding, spinning, and twisting machines, Bobbin and cop builder for....J. S. Berard
Wire bed-bottom fabric, 2 pats..C. H. Halstead
Wire bracket or holder and insulator....I. L. Edwards
Wire clamp or grip....G. H. Glass et al
Wire-fastener....A. W. Burbury
Wire-stretcher....W. C. Richardson
Wire-stretcher and wagon-jack, Combined....E. G. Boyes
Wiredrawing-block....H. R. Humphrey
Wiredrawing-machine....C. A. Carlson
Wood, Apparatus for use in treating....S. S. Williams
Wrench....T. W. Harber
Wrench....J. G. Swallow
Wrench and tool-holder....J. D. Heck
Yoke center, Neck-....H. H. Bromley

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Agricultural implement....J. J. Fruecht et al
Air and gas compressor....H. L. Borchers
Air, Humidifying....W. G. R. Braemer
Ammonia, Manufacturing....F. W. Frerichs
Amusement device....A. Bragg
Anchor, Post-....C. L. Obinchain
Animal-trap....C. B. Trumble
Anticollision device....A. Walker
Apron-fastening device....M. J. O'Connor
Arch-support....W. H. Wood
Arcs, Striking voltaic....A. J. Petersson
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Attrition-mill plate....L. E. Bauer
Autographic register....C. M. Kirkland
Automatic draft-regulator, Hot-water-heating-system....E. Berge
Automobile drawing mechanism..R. F. Stewart
Axle....J. C. Heinzelman
Axle-spindle, Turning....S. A. Davis
Barrel....W. P. De Laney, Jr.
Basket....G. W. Hoffman
Battery-cradles, Device for suspending....E. Gruenfeldt
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Bearing for looking-glasses, &c., Frictional....W. J. Sturgess
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Beds, &c., Spring-bottom for....G. B. Smith
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Bedsteads, Combined mosquito-bar and table attachment for....M. E. C. Cowdrey
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Beehive-carrier....A. C. Brovald
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Belt-tightener....B. M. W. Hanson
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Binder, Loose-leaf....C. C. Maltby et al
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Boat, River-....P. Sigaudy
Boiler-alarm....W. Loudon
Bolt-pointing machine....C. Sonneborn
Boot and shoe cleaner....E. M. Rich
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Bottle....E. Witman, Jr.
Bottle-cooler....O. Krüger
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Bottle-washing-machine spindle....E. Court
Bottles, &c., Machine for wiring....C. A. V. Hällgren
Bottles or similar vessels, Stopper for....T. B. Swahn
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Box....S. V. Wright
Box....T. S. Goff
Box....D. Fraser
Box-lid support....H. C. French
Box-opener....J. F. Dunn
Bread-mixer....J. B. Collins
Bridle, Blind-....G. Holding
Brush-holder....H. F. T. Erben
Butter-separator....J. M. Fleming
Button....N. C. Newell
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Calculating-machine....W. F. Hausstein
Calculating-machine motor-drive..F. M. Carroll
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Can, Oil-....W. S. McCracken
Can-punch....W. R. Heber et al
Can-seaming machine....H. Diecks
Cans, Machine for fusing or soldering heads upon square or rectangular....F. Eberhart
Cans, Sterilizing sheet-metal....J. G. Hodgson
Car....C. K. Pickles
Car cable-grip, Tram-....H. O. Ofstad
Car-door....S. P. Massey
Car, Dumping-....M. Orenstein
Car-fender....E. T. Hardin
Car gate, Dump-....T. R. McKnight
Car, Passenger-....S. M. Curwen et al
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Car, Railway-....B. J. Leslie
Car roof, Railway-....J. Masker
Car side bearing....J. E. Norwood
Car-truck center-bearing....J. J. Skahen
Car truck, Railway-....E. G. Hoffmann
Car-truck side bearing....J. J. Skahen
Car-truck side frame and brake-hanger....G. G. Floyd
Car-underframe....J. S. Andrews
Car underframe, Steam-shovel....T. E. Adams, et al
Carbonaceous materials, Briqueting....W. T. Griffin
Card-case....G. Coon
Card-rack....H. E. Read
Carpet-sweeper....J. T. Grzybowski
Carrier system, Automatic....C. W. Darson
Caster, Ball....J. Sterba
Casting-machine....J. B. Ladd et al
Casting machine, Line-....D. S. Kennedy
Catch, Automatic....F. Willimak
Cement burial-vault....C. A. Gibson
Cement-drain-tile-making machine....J. Cardiff
Cement, Treatment of blast-furnace slag for production of hydraulic....B. Grau
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Chair fan attachment....C. H. Towers
Chair-seat....A. H. Barber
Chairs and the like, Attachment for barbers'....J. Mentz
Chalk and eraser holder....J. I. McAllister
Charging-machine....E. Norton
Chlorin, Dehydrating moist....E. A. Sperry
Chuck-actuating device....B. M. W. Hanson
Cisterns, Means for plugging the outlet-pipes of....R. S. Godson
Cleaning device....F. Dugas et al
Clevis....M. Paveletz
Clock....A. L. Hahl
Closure....W. R. Comings
Cloth-cutting machine....C. F. Mitchell et al
Clutch....J. F. Dornfeld
Clutch....O. R. Mitchell
Clutch and clutch-operating mechanism....J. D. Maxwell
Clutch, Combined friction and jaw....C. J. Widmer
Clutch, Driving-....A. P. Morrow
Coal or rock drilling machine....A. Ball
Coat and trousers hanger, Combination....J. F. Claussen
Coating-machine....M. A. Smith
Cock, Compression-....E. G. Hedges
Coin-controlled lock....J. Smith et al
Colors, Making lake....F. M. Winter
Column....V. I. Richards
Combing-machine....M. Roth
Combing-machine draw-off device....C. Kröger
Compressor, Air-....C. W. Moore
Concrete-structure reinforcing-bar..A. Thomas
Condiment-holder....J. B. Williamson
Controlling device....A. Balloco
Conveyer....A. W. Lind
Cooker....A. W. Morrell
Cooking-utensil handle mechanism....J. C. Hollands
Copper and purifying, casting, and alloying the same....A. J. Rossi
Corn harvesting and husking machine....E. G. Calkins
Corn-sheller....C. J. Widmer
Covering, Portable....L. H. Troutman
Crank-press....N. Sperber
Crate, Folding....W. H. Wolf
Crystalline substances from liquor and drying the same, Recovering....C. Ordway
Cultivator....J. Beard
Cultivator disk attachment...W. A. Biesenthal
Cultivator, Rotary....L. Prue
Current clutch, Alternating-....A. G. Davis
Current magnet, Alternating-....T. E. Barnum
Current generators in multiple, Operating rect-....P. W. Peck, jr
Current-motor....A. K. [illegible]
Current-motor....F. R. McCrea
Curtain-pole....L. W. [illegible]
Curtain-stretcher....C. L. Stoy
Curtain stretcher and drier, Lace-....M. Smith
Cyclometers, Mechanism for actuating....H. D. Wood et al
Dental appliance....E. E. Holmes
Dental articulator-hinge....R. Syke[illegible]
Dentists' cuspidors, Disinfector for....H. P. Roberts
Derrick, Portable swinging....L. [illegible] Mitchell
Die....C. [illegible]
Dish-staff, Adjustable....H. L. Withered
Disk propeller or game apparatus....W. J. Reese
Display-rack....C. Bell
Distribution system....L. Fleischmann
Ditching or tile-laying machine....A. Matson et al
Dividers....P. Splaid
Door-equalizer....E. A. Benjamin
Door hinge and brace, Combined drop-....C. W. Listerman
Door lock, Sliding-....G. M. Blair
Door, Safe-....J. M. Allen
Door-stop....D. A. Fies
Draft-equalizer....S. E. Baylor
Draft-gear....W. M. Pond
Draft-timber reinforcement....W. W. Decker
Drawer, Spring-....W. Lambert et al
Dress-form....I. Levin
Dust-guard....E. Peckham
Dyeing-machine....R. P. Smith et al
Egg case or carrier...M. H. and L. B. Wilson
Egg-turner....I. L. Nix
Electric call-bell....C. and W. Reinker
Electric controller....R. R. Root
Electric exhibitor....B. H. Winters
Electric fluid-heater....J. S. Smyser
Electric heater....A. C. Dunham
Electric-light-bulb shield....B. R. Williams
Electric machine, Dynamo-....C. M. Green
Electric machine, Dynamo-....S. S. Forster
Electric machine, Dynamo-....C. M. Green
Electric machine, Dynamo-....F. B. Howell
Electric signaling system...E. E. Kleinschmidt
Electric-vehicle motor-control system....M. R. Hanna
Electric-wire grounding-clamp....W. H. Vibber
Electric-wire seal....O. W. Neal et al
Electrical conductor for dynamos....W. J. Richards
Electrical connector....P. E. Gilling
Electrical sealing-cap apparatus..J. G. Swallow
Electrode....A. G. Davis
Electrode, Negative-pole accumulator-..E. Sokal
Electromagnetic switch....T. E. Barnum
Electroresponsive device....E. A. Buckman
Elevator guide-rails, Means for lubricating....F. MacIndoe
Embalming fluid....W. L. Frye
Embroidering-sewing-machine stretching-frame....S. V. Swoboda
Engine balanced valve, Steam-..F. Barngrover
Engine driving-gear, Petrol or gas internal-combustion or steam....C. J. Montgomery
Engine starting mechanism, Explosive-....W. R. Webster
Engines, Admission-valve and valve-actuating mechanism for gas-....G. B. Petsche
Engines, Water-circulating apparatus for internal-combustion....J. W. Smith
Engraving-mill....C. A. Ker
Envelop....E. Halfin
Envelop....A. J. King
Envelop and wrapper....J. H. Hirst
Envelop, Safety-....W. E. Smith
Excavating apparatus....M. M. Defrees
Explosion-engine....E. Apperson
Explosive-motor....H. A. Bertheau
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Fans, Operating pneumatically-driven....J. L. Creveling
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Fastener....A. F. Raymond
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Fastener, Snap-....A. F. Raymond
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Feed-bag....D. C. Martin
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Fiber stock from cornstalks and analogous plants, Preparing....G. R. Sherwood
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Fire and temperature alarm or indicator....G. L. Smith
Fire-extinguisher....D. W. Diggs
Fishing-reel....C. D. Rider
Fishing-rod reel-clamp....J. Heddon
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Flower-box....E. Schaffer
Flower-repairing device....I. L. Pillsbury
Fluid-fuel-feed regulator, Steam-boiler....J. D. MacLachlan
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Molding-machine....J. F. Nolan
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Packing-case....L. D. Morton
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Pail, Milk-....M. M. Lahue
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Paper-softening apparatus....T. Scherf
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Pen holder, Fountain-....F. D. Brown
Pendulum-top....J. E. Z. Fowle
Phonograph....J. E. Hough
Photographic emulsion....J. T. Gateau
Photographs, Apparatus for the production and exhibition of colored....C. J. Drac
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Piling....L. E. Edmunds
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Plants, Machine for treating fibrous....B. C. Mudge
Planter and fertilizer-distributer, Combination....J. B. West
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Plate-rack....A. E. McCombe
Plow, Riding-....G. L. Hoffman
Plug, Wall-....W. M. Hoerle
Pocket, Garment-....W. J. Cummings
Poke, Animal-....O. A. Qualey
Post-hole auger....W. J. Miller
Post or column, Metal....S. H. Tyson
Poultry-coop....F. T. Wing
Poultry feeding and watering device....H. C. Benefiel
Powder-receptacle....A. MacPhee
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Pressure-filter....C. W. Merrill
Pressure-regulator....G. E. Hulse
Pressure regulator, Fluid-....G. E. Hulse
Printing-machine....J. L. Firm
Printing-machine....M. H. Mann
Printing-plates, Making metallic....J. O. DeWolf
Printing-press....C. Martin
Printing-press attachment....C. Merz et al
Printing-press inking-roller...A. Munzesheimer
Printing-press-plate clamping mechanism, 2 pats....S. G. Goss
Printing-presses, Plate-clamping mechanism for rotary....W. Evensen
Pulley-block....W. N. Head
Pulley or wheel....J. T. Duff
Pulp-drier....H. A. Vallez
Pump, Bicycle-....H. C. Brooks
Pump, Lubricating-....C. Lang
Pump or fan, Centrifugal....O. Krell
Pump, Pneumatic....C. W. Moore
Pump, Self-measuring oil-....J. B. Davis
Pumps, Overflow-stop for lift and force....E. Noppel
Quill....B. M. W. Hanson
Rail and railway....J. Wissler
Rail-joint....A. Sarko et al
Rail-joint....J. B. Baum
Railway and like vehicles, Brake mechanism for....E. S. Luard
Railway-brace....F. J. Taber
Railway construction....A. L. Bush
Railway-crossing....A. Gerstner
Railway-curve lubricator, Automatic....E. O. Hicks
Railway-rail bond....A. Gething
Railway-rail support and fastener....G. Gates
Railway-signal, Automatic....W. H. Harris
Railway-tie....O. Rowlett
Railway-tie....R. J. Carr
Railway-tie and fastening....T. E. Stockford
Railway-tie and rail-fastener..L. E. Barton, Sr.
Railway-tie, Metallic....Z. Mroczkowski
Railways and the like, Metal sleeper for....A. Ambert
Railways, Support for the crossing-rails of....H. H. Dudley
Range, Camp-....J. Conley
Reducing-machine attachment....B. M. W. Hanson et al
Refrigerating plants, Regulating device for....O. Levilly
Regulating apparatus, 2 pats...D. H. Haywood
Releasing-hook....O. C. Porter
Riveting implement....H. Overman
Roads, pavements, &c., Machine for surfacing....C. M. Ingersoll
Rocking-chair, Self-fanning....W. H. Gartz
Roll-shutter and life-saving ladder, Combined....J. Hengstler
Roller, Land-....O. K. Harry
Rope-clip....C. M. Mockbee
Rope-making machine....E. O. Berg
Rotary engine....B. B. Rockwood
Rotary engine....F. Stoehr et al
Sack-fastener....E. C. Fawcett et al
Saddle, Top-roll....E. Dixon
Safe-closing means....G. A. Hattersley
Sales-check, Manifold....F. Thomas
Sand or abrasive paper holder....C. C. Sadler
Sash-balance....E. J. Reilly
Saw, Meat-block....W. M. Wise
Scaffold-bracket....M. and J. L. Mani
Scissors-sharpener....L. M. Larsen et al
Screens and other frames, Joint for....F. W. Van Fleet
Screw-machine....L. W. Noyes
Screw-punch....F. Torka
Sculpturing apparatus....A. Drexler
Sea-wall, breakwater, and similar structure....W. Smith
Seat....J. Solomon et al
Secondary combustion, Automatic regulating mechanism for....F. H. Brown
Sewing-machine....J. J. Heys
Sewing-machine looper mechanism....W. M. Ammerman
Shade....L. Vercoutere
Shaft-bending machine....G. F. Hartley
Sheave....T. H. Skinner
Sheets, foil, strips, or ribbons of zinc, lead, or other metal or alloy, Manufacturing....E. H. Strange et al
Shell....G. M. Peters
Shirt form and fastener....H. A. Jenkins
Shock-absorber....W. P. Kidder
Shock-loader....J. O. Ryin
Shoe antislipping device....S. Frautschi, Jr.
Shoe-blacking stand....A. H. Weston
Shoe-last....F. E. Benton
Shoe-soling device....A. B. Grodaes
Show-case....C. L. Peters
Show-case....J. S. Garman
Sifter, Gyratory....A. C. Brantingham. (Reissue.)
Sign....C. A. McNeal
Sign, Cross-road....F. E. Watkins
Sign, Electric....J. P. Shearer
Sign, Metal....W. J. Reeser
Signal and order attachment for rural-route mail-boxes....J. H. Brockway
Signal apparatus....L. G. Woolley
Signal system....J. L. Hall
Skillet....E. A. Hudson
Skirt-marker....M. B. Longnecker
Sled-runner....J. E. Johnson
Sleigh, Motor-propelled....M. Trunt
Sleigh-runner, Temporary....J. B. Crane
Slipper, Folding....E. A. Jennings
Sluice....A. A. Cummings et al
Smoke-consuming furnace..H. A. Jackson et al
Smoker's stand....J. H. Astruck
Snap-switch....F. S. Capello
Speed-changing mechanism....B. Beskow
Speed-indicator....A. Turner
Speed mechanism, Variable-...A. L. De Leeuw
Speed mechanism, Variable-..B. M. W. Hanson
Spinning and twisting machine, Ring....P. A. Mayer
Spinning-frame, Flier....J. Robertson
Spinning-machine....E. Dixon
Spinning or twisting machine thread-guiding mechanism....C. A. Taft
Spraying device....C. Truman
Spring-retarding device....C. W. Kelsey
Sprinkler....W. C. Matthias
Sprinkling-can....J. L. Armstrong
Sprocket-wheel....F. J. Oakes
Stake-holder....A. J. Bostwick
Starter, Automatic self-....C. H. Miller
Stay, Garment-....C. J. Hagen
Steam-trap....L. Hand
Steering device for sleds....H. L. Hoard
Steering-mast support, Adjustable....E. Gruenfeldt
Stock-feeder....S. F. Webb
Stoker for locomotives, Mechanical....D. F. Crawford
Storm-apron device....J. H. Powers
Straight-edge....A. J. Perks
Strap holder, Hitching-....F. A. Gilcrest
Stove, Flat-iron....E. W. Rice, Jr.
Stump-puller....W. C. F. Zibberman
Supporter....N. Johnson
Surgical device....J. H. English
Swing....S. W. Newcomb
Switch-lock, Automatic....W. L. Wilson
Switch-point lock....A. D. Cloud
Switch-thrower, Automatic....E. P. Cook
Syringe attachment....C. L. Loffler
Table for facilitating gymnastic exercises....P. Gagey
Target, Shooting-gallery....C. B. Winder
Telegraphic repeating apparatus....W. E. Athearn
Telegraph type-writer....G. A. Cardwell
Telegraphy, Receiver arrangement for wireless....G. Johr
Telephone-receiver....N. Baldwin
Telephone-exchange apparatus....E. E. Yaxley
Telephones, Shield for mouthpieces of....T. M. La Jord
Temperature reader and recorder, Electrical....G. E. Kirk
Textile plants, Chemically retting and ungumming of all....A. Blachon et al
Thill-coupling....J. B. Jaekson
Threshing-machine separating mechanism....A. D. Baker et al
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Tie-rod, Railway-rail....H. Herden
Tiling....C. E. Hyke
Tire-armor....W. A. Mix
Tire-fastener....J. D. Maxwell
Tire, Pneumatic....F. Richardson
Tire, Pneumatic....L. J. Westness
Tire-setting device, Rubber-...W. W. Edmisten
Tires, Pressure-indicator for pneumatic....F. O. Wolff
Tobacco-pipe....A. Labarre
Tongue-support....C. Coppock
Tool....F. E. Gordon
Tool, Combination-....I. N. Tower
Tool, Combination-....N. Townsend
Tool water-spraying device, Pneumatic-, 2 pats....A. H. Taylor
Toy, Dancing....A. A. Jones
Toy, Figure....J. Dermenstein
Traction-engine....D. T. Timberlake
Traction-wheel....D. T. Timberlake
Trellis....C. A. Case
Trolley-head mounting....J. J. Bennett
Trolley-retriever....C. Norland
Trunk attachment....F. Strauss
Trunk-lids or the like, Support for....J. A. I. Claudon
Tufting-machine....E. D. Barchman
Turbine-bucket....W. F. Rice
Turbine bucket-wheel....C. H. Worsey
Turbine, Elastic-fluid....H. B. Karlin
Turbine, Elastic-fluid....R. H. Rice
Turbine, Elastic-fluid....J. G. Callan et al
Turbines or the like, Lubricating-bearing for steam-....G. L. Bascome et al
Tying-machine....H. D. Colman
Type-setting machines, &e....E. F. Linke
Type-writer cover....W. M. Sykes
Type-writing and computing machine, Combined, 2 pats....H. Hanson
Umbrella and cane, Folding....W. H. Gaskill
Underreamer....J. Fort
Valve....O. E. Oleson
Valve....T. R. Tarn
Valve....F. L. Orr
Valve-nut....W. H. Noonen
Valve-operating mechanism....P. D. Johnston
Valve, Tank-....J. H. Boggess
Varnish and manufacture thereof....F. R. Suter
Vehicle box and frame lift, Automatic....H. C. De Weese
Vehicle-brake....L. Whiteside
Vehicle controlling device, Motor-....W. C. Van Buren
Vehicle elastic or pneumatic tire, Road-....H. J. Scott
Vehicle, Motor-....E. Rosenberger
Vehicle traction-wheel and runner....W. N. Britton
Vehicle transmission-gearing, Motor-....K. Probst
Vehicle truck, Railway and tramway....E. Peckham
Vehicle-wheel cushion-tire....G. O. Maulsby
Vehicle-wheel hub....C. L. Elliott
Vehicle with limited variations in intensity, Self-regulating electrically-propelled....L. Krieger
Vending-machine....R. E. E. Weitlich
Vending-machine....J. H. Billmeyer
Vending-machine, Automatic....A. P. Holden
Veneer-package machines, Collapsible drum for....E. L. Gage
Ventilating apparatus....A. Breese
Ventilator....L. M. Doyle
Ventilator....W. F. Warden
Vessel filling and emptying device....E. Langford
Vibrator....F. R. Muenzenberger
Voting-machine....A. McKenzie
Wagon-coupling....J. F. Morris
Wagon dump and elevator....F. Gahm
Wagon-top, Folding....L. D. Pangborn
Wall, Retaining-....M. M. Upson
Washing-machine bearing....J. H. Knoll
Washing-machines, Mechanical movement for operating....W. H. Voss
Water-closet....J. W. Kelly
Water-cooled mold....G. O. Seward
Water-elevator, 2 pats....E. R. Converse
Wax-extractor....A. C. Miller
Web-guilding device, Automatic...W. I. Lewis
Welding fluid....V. Massimino
Well-digging machine....J. H. Clack
Well mechanism....M. E. Layne
Wheel-casting mold....H. E. Chipman
Winding mechanism, Line-....H. A. and N. Krause
Windmill....L. Johnson
Window-screen....J. M. Beahan
Window-ventilator....J. A. Shea
Wire-stay-bending machine...W. F. Washburn
Wires, Machine for crimping electric resistance-....J. I. Ayer
Wrench....W. W. Patterson
Wrench....E J. Washbroad
Wrench....C. J. Whitmore
Wrench-handle....V. A. Clarke et al
Zinc, Extracting....E. H. Shortman
Zinc-plating, Electrolytic solution for....C. Brianco
Zither....J. D. Foreman

DESIGNS.

Badge....C. J. Dieges
Belt....L. Hauser
Casket pedestal, Burial-....C. H. Hiser
Comb, Back....A. E. Newton et al
Hat, Soft felt....H. H. Roelofs
Lamp-pedestal....A. L. Swift
Spoon, fork, or similar article....B. P. Jenks et al

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Abdominal bandage and corset, Combined....R. Marks
Addressing-machine type-plate and drawer....R. N. Rogers
Air-compressor, Rotary....S. J. Everts et al
Air-cooling device....G. W. Haverstick
Air-rifle, &c....H. A. C. Schobbert
Alumina and silica, Composition of matter containing....F. J. Tone
Anchor palm, Stockless-....F. Heuss
Andiron....H. A. Frentz
Angle-piece of laminated material....J. R. Jaek
Animal serum, Obtaining curative....R. H. Deutschmann
Anklet or spat....J. S. Mead
Antiseptic compounds, Preparing....J. L. Turner et al
Automobile-horn....I. E. Stump
Automobile running-gear....M. L. Williams
Automobile spark-adjusting starting means....A. L. Riker
Automobiles, Differential clutch mechanism for, 2 pats....F. W. Hedgeland
Axle lighting system, 2 pats....A. McGary
Back-pedaling brake....A. P. Morrow
Bag....R. S. A. Moore
Bag-closure....T. Manahan
Baling-press....F. McKinney
Bank, Coin-assorting savings-...A. L. Andrews
Barrel, Paper....J. Herr
Base-ball glove....C. A. Peterson

Baths, Maintaining a constantly-open feeding-passage into the interior of molten.....F. O. Stromborg
Bearing, Antifriction-.....J. P. Karns
Bearing, Ball-.....O. E. Michaud
Bed.....J. J. Drawe et al
Bedstead.....J. A. Wilson
Bending-machine.....J. B. Cameron
Binder, Loose-leaf.....C. L. Benedict
Block for building purposes, Insulating-.....J. E. Howe
Blower or gas-pump, Rotary.....J. T. Wilkin
Boat launching and stowing apparatus.....F. E. Martin
Boiler-furnace.....J. O'Neill
Book cover, Loose-leaf-.....M. H. Baker
Boomerang.....C. L. and E. M. Dawes
Bottle-filling machine.....A. T. Collins
Box.....A. O. Hubbard
Box-bearing.....A. L. Christenson
Box, &c., corner-stay.....H. H. Dewey et al
Box-filling machine.....M. M. Robb
Brake-beam.....W. E. Fowler, Jr.
Brake-head.....H. B. Robischung
Breech mechanism of ordnance.....A. T. Dawson et al
Bridle-bit.....C. E. Taylor
Briquet-making apparatus.....J. W. Ivery
Broom-protector.....A. J. Myers
Brush, Fountain-.....T. R. Murray
Brush-making machines, Needle-holding slide for.....W. G. Liebig
Brush, Tooth-.....J. H. Kinney
Bucket.....H. S. Atkinson
Buckle.....B. Jacob
Buckle.....G. C. Dickson et al
Buckle for running webbing.....F. A. and J. B. Russ
Button.....W. A. Tetlow
Button-polishing tongs.....W. Tilson
Cabinet, Post-card.....F. A. Dabney et al
Cabinet, Revolving.....H. W. Anderson
Cable-hanger.....C. G. Harrington
Camer attachment.....E. L. Hall
Can, Compartment friction-top....H. W. Jones
Can-opener.....O. E. Braconier
Cans, Apparatus for removing the contents from.....C. M. Lamovitié
Car-coupling.....J. M. Callju
Car-coupling.....J. and J. O. Timms
Car-coupling.....T. Simms
Car-coupling.....I. Sparks
Car door, Grain-.....W. H. McMachen
Car, Dump-.....S. D. Wright
Car for bonding rails.....A. B. Herrick
Car-roof.....B. S. Warren
Car-signal.....W. H. Schweizer
Car sleeping attachment.....J. A. Shires
Car-step, Auxiliary.....E. L. Carroll
Car-testing device.....A. B. Herrick
Car transfer-ticket-dispensing device, Portable street-.....F. D. Covington
Car-ventilator.....L. B. J. Thurston
Carbohydrates soluble, Rendering....A. Boidin
Carbonating apparatus.....H. Pein
Carbureter, Automatic double air-inlet for.....J. L. Plain
Carbureting apparatus, Air-....S. W. Peregrine
Carbureting plant.....S. W. Peregrine
Carpet-cleaning machine, Pneumatic.....J. F. Rudd
Carriage-top bow-separator.....A. W. Stengel
Casein, Preparation of.....E. Soncini
Cash-carrier.....C. F. Bodinus
Casket-handle.....S. W. Babbitt
Casting-mold structure-lifting device.....E. A. Custer
Cell, Galvanic.....J. T. Szek
Centrifugal machine for drying.....A. J. Ericsson
Checkrein, Automatic.....E. M. Martin
Cheese-cutter.....J. Grouan
Chimney-flue clean-out.....H. N. Holder
Chuck.....W. B. Johnson
Chuck.....E. R. Sibert
Chuck, Drill-.....P. Pfeifer
Churn.....M. M. Appleman
Churn.....A. E. Cherry
Cigar-package.....J. W. Michel
Cigar-rest, Sanitary.....G. F. Southard
Circuits, Regulation of the period or inductance of high-frequency.....G. Ferrié
Clamp.....E. Barnes
Closet-seat hinge.....J. H. Davis
Clutch.....O. E. Lutz
Clutch, Friction-.....J. J. Zeitz
Coal, slate, &c., separator.....D. E. Phillips
Coal-washing apparatus.....W. A. Knoyer
Coaster-brake, Back-pedaling.....A. P. Morrow
Collapsible box.....F. A. Scruby
Collar, Horse-.....O. W. Walters
Column.....J. Lally
Compression-coupling.....W. S. Burgess
Concentrating apparatus.....W. E. Darrow
Concrete ceilings, Stay or support with steps for producing.....C. Bürker et al
Concrete reinforcement.....J. J. Whiteacre
Concrete vault and grave appliance, Combination underground reinforced..W. E. Thomas
Cooker, Steam-.....J. M. Lewis
Cooking utensil.....C. B. Jacoby
Cooking utensil.....R. C. Paulus
Cooking utensil.....W. D. Earl
Copper, Composition of matter to be used for the welding of.....J. Crew
Cord-holder.....J. A. Leifer
Core-making machine.....F. C. Francisco
Corn or grain crib.....C. B. Hurst
Corroding-pot.....A. J. Melie
Corset, Abdominal reducing-.....S. Burnstein
Cotton thinning and weeding machine.....W. H. Hance
Coupling.....E. G. Gaylord
Coupling attachment.....R. C. Hilton
Cross-tie.....W. A. Lockwood et al
Cuff-holder.....E. Michaelson
Cultivator.....A. L. and R. L. Baker
Cultivator cross-head.....J. E. Johnson
Cultivator replanting attachment..M. D. Moore
Cultivator, Spring-.....J. Hagedorn
Current distribution, Two-phase alternating-....H. S. Russell et al
Current motor, Alternating-.....E. Danielson
Current of gas or liquid, Valve for automatically and intermittently interrupting a.....G. von Post
Current switch, Alternating-..F. W. Smith et al
Curtain-fixture.....W. C. H. Pfeil
Curtain ring and fastener, Combination.....H. P. Hansen et al
Curtain-pole-lifting device.....C. Hallgren
Curtains and window-shades, Holder for lace..W. Stuck et al
Cutting and polishing machine, Diamond.....A. Henius
Cycle frame, Motor-.....A. H. Harman
Damper-clip.....J. C. Meister et al
Dash-pot.....G. Goetz
Dermatological instrument.....A. L. Tolman
Desk, Lap-.....H. L. Bowman
Desk, Table-.....D. McKinlay
Disinfecting apparatus.....M. Schnaier
Disks in a centrifugal separator-bowl, Device for removing and replacing the conical.....A. F. Ahlberg
Display-reel.....T. A. K. Oren
Distributer and conveyer.....M. and H. W. Garland
Door check and securer, Combined.....W. F. Schacht
Door fastener, Sliding-.....N. T. McCleer
Door-holder.....C. J. Caley et al
Door-latch.....F. F. Schleicher et al
Door lock, Sliding-.....A. H. Richards et al
Door shield or cover, Barn-.....A. H. Sites
Door, Swinging.....W. T. Waterstraat
Dough-kneader.....W. Palmer et al
Draft-equalizer.....R. P. Harriman
Draft-equalizer.....W. E. Royse
Dredge or the like, Suction-.....F. H. Jackson
Driven wheel.....J. T. Moore et al
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Dumping mechanism for excavating-buckets.....C. C. Jacobs
Dust-guard.....H. and P. Martin
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Dye and making same, Anthracene.....O. Bally et al
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Dyestuff, Yellow monoazo...W. Herzberg et al
Egg-crate, Folding.....H. D. Dennis
Electric-circuit making and breaking device.....J. Ryan
Electric cut-out and holder.....T. E. Murray
Electric indicator.....C. von Pelz
Electric-light-cord take-up.....A. W. Pratt
Electric-machine winding, Dynamo-.....G. R. Maxwell
Electric machines, Coil-support for dynamo-.....I. L. Griffith
Electric machinery, Coil-support for.....B. G. Lamme
Electric-motor-control system..W. Cooper et al
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Electric outlet-box.....C. J. Dorff
Electric switch.....B. W. Allen
Electric terminal post.....A. G. Wilson
Electric-wire terminal.....B. Morgan
Electrical apparatus.....K. C. Randall
Electrical conductors, Connector for.....C. W. Beck
Electrical-distribution system.....J. L. Woodbridge
Electrical transmission of designs, figures, and photographs, Means for.....G. J. D. Garcia
Electricity-meter.....G. A. Scheeffer
Electrolyte.....E. C. Broadwell
Electrolytic apparatus.....E. D. Chaplin
End-gate.....J. B. Hennemann
Engine.....H. Drake
Engine.....R. C. Hoffman
Engine.....E. A. Williams et al
Engine exhaust device, Compression-.....E. F. Hafelfinger
Engine starting device, Automobile-.....S. E. Spencer
Engine starting mechanism, Explosive-.....C. A. Johnston
Engines, Front-wheel drive for traction-.....J. A. Peters
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Envelop.....C. R. Rawdon
Envelop.....G. Dumas
Envelop.....J. Carter
Explosive-engine.....H. Charles
Explosive-engine.....P. V. Rehill
Explosive-engine, Multiple.....E. H. Williams
Explosive-preserving apparatus.....J. Ortiz
Eyeglasses.....H. P. Alexander
Eyeglasses, Nose guard or clip for.....J. H. Ostrander
Fabric, Woven.....W. M. Stevenson
Fabric, Woven.....H. Sarafian
Fence-brace.....L. F. Tissot
Fence tie, Wire-.....R. A. Pringle
Fencing, Field-.....D. C. Smith
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Fiber container.....M. D. Porter
Fibrous materials, Washing or disinfecting....F. L. Bartelt
Fire-extinguisher, Chemical.....A. C. Badger
Fires, Water-storage system for use in extinguishing.....L. H. Sondheim
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Floor-dressing machine.....A. Kraemer et al
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Fluid storing and transporting receptacle.....J. R. Carmer et al
Flying-machine, Aeroplane.....T. H. Gignilliat
Folding box.....F. H. Hougland
Folding box.....F. Treischman
Folding-machine die.....J. Maitland et al
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Foot-block, Radiator adjustable..H. E. Jennison
Form, Dress-.....C. A. Ufford
Forming machinery.....J. Cuthbert
Friction coupling.....P. Daimler
Fruit-picker.....J. S. Griffin
Fuel, Artificial.....T. W. Ivery
Fuel-coke, Treatment of.....H. L. Bruce
Fuel heating-burner, Liquid-....K. Kaltschmid
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Furnace and crucible refractory material.....W. Rippey
Furnace construction.....W. A. Walker, Sr.
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Garment-holder.....W. C. Morris
Gas cut-off, Automatic.....M. F. Nichols
Gas-mains, Automatic device for operating water seals for.....L. Shaw
Gas-meter, Slot.....F. Smith
Gas-oven, Portable reel.....G. B. Meek
Gas-producing apparatus.....G. Marconnet
Gas-tube, &c., coupling.....H. Holton
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Grain by fumigation, Sterilization of..J. Bloch
Grain, &c., Combined conveyer and purifier for.....A. Frister
Grain-elevating machine.....E. H. and L. Westbrook
Grease-cup.....F. L. Swanberg
Gun magazine-tube, Air-.....W. A. Heilprin
Hame and trace connector.....B. F. Wren
Hame-hook.....J. F. Willis
Hammock.....T. W. Draper
Harness-holdback.....H. I. Persels
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Harvester, Potato-.....B. H. Pugh
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Headlight-operating device.....J. Kaufman
Heating apparatus.....T. T. Hossack
Heating apparatus.....L. L. Lewis
Heating-furnace.....J. J. Harkins
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Hinge.....J. B. Mayo
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Hoe.....F. A. Beach
Hoisting device.....B. A. Foust
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Horse equalizer, Three-.....G. A. Crum
Horse-releaser.....P. O. McNicol
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Hydrant.....D. F. O'Brien
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Kinetoscope safety-shutter.....H. Naylor, Jr.
Label-holder.....M. Joachimson
Lamp guard, Incandescent-electric-.....W. H. Greenwood
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Last-forming apparatus, Sectional-.....J. T. Brown
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Linoleum and like fabrics, Machinery for calendering.....J. Wright
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Locomotive-firing device.....W. A. Tetlow
Locomotive-service heater system...R. V. Jones
Loom draw-detecting mechanism.....W. P. Phillips et al
Loom for weaving.....F. Alsina
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Magnetos, Distributing-arm for high-tension...T. Hubert
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Mail-bag receiving and delivering apparatus....G. Lindahl
Mail-box.....J. N. Coulter
Mail catcher and deliverer.....B. B. Clark
Mail-deliverer.....J. R. Hendrickson
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Mangle.....C. Stastka
Manure-loader.....C. R. Roberts et al
Match-box.....J. Yoakum
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Meat-compressor.....A. Rispel
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Metal receptacles, Reinforced breast for sheet-.....L. Sturges
Metal-working tool.....C. McSherry
Meter-readings, Means for recording.....S. C. Shaffner
Meter statement-delivery mechanism.....R. W. Gallagher. (Reissue.)
Mica between segments in commutators, Machine for cutting out.....O. F. Reinen
Miners' safety-candlestick.....F. Muenger
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Mold-manufacturing device.....E. Friedheim
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Molding apparatus.....F. Kreger
Molding-fastening.....A. C. Goddard
Molding-machine.....J. G. Morrison
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Nut-lock.....J. J. Brown
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Paper holder and cutter, Roll-.....N. O. Daly
Paper shells, Folder for closing the ends of.....J. Chesney
Paper vessel.....C. T. Bloomer
Paste-tube.....C. M. Cole
Pea-separating machine.....C. F. Shumaker
Pedal-action.....M. F. Richardson
Pen, pencil-holder and letter-scale, Combination.....W. D. Stewart
Phonographic horn.....L. H. Devineau
Photograph-holder.....A. H. Sturla
Photographer's apparatus.....Z. J. Gold
Piano, Automatic-playing.....P. Wuest, Jr.
Piano-flange-attaching bar, 2 pats.....F. C. Billings
Picture-frame.....E. W. Craig
Picture-hanger.....S. A. Graninger
Pigments by electrolysis, Producing.....E. D. Chaplin
Pipe-coupling.....H. D. C. Harrison
Pipe-coupling, Train-.....W. A. Orr et al
Pipe-testing apparatus.....I. A. Hock
Pipe-wrench.....C. D. Peters
Piping.....G. W. Christoph
Pipes, Casting.....E. A. Custer
Planter.....A. A. Wofford
Plow.....F. Luchini
Plow, Combined grader and snow-.....M. Shcahan
Plow landside.....J. C. and J. A. Fischer
Plow, Wheel-.....J. R. Mueller
Pot-stilt.....L. Connor
Potato-bug-destroying machine.....O. Schnicke
Potato-cutter.....D. C. Rule, Jr.
Potato-digger.....L. M. Hoftrup
Power-transmission device.....J. O. Stanley
Power-transmission mechanism.....W. R. Donaldson et al
Precipitating apparatus.....J. E. Greenawalt
Preserver, Life-.....F. A. Cooke
Preserver, Life-.....J. U. de Uherkócz
Press safety attachment.....C. L. Wagandt
Printing-press folding mechanism, Web-.....H. F. Bechman
Printing-press jogger.....J. H. Stonemetz
Propeller-wheel.....R. Thaler
Pump.....H. Braden et al
Pump.....W. F. Hervey
Pump, Self-measuring oil-.....G. F. Welch
Pump valve-gear, Simplex-.....P. F. Oddie
Puzzle.....J. F. Brown
Puzzle.....A. Murf et al
Rack attachment, Display-.....G. J. Willner
Rail-chair and fish-plate, Combined.....F. Hauser
Rail-fastening device, 2 pats..E. T. Ford et al
Rail-joint.....J. W. Flowers et al
Rail-joint.....A. H. Shoemaker
Rail-joint.....J. Martin
Rail-joint.....J. E. Salkeld
Rail-joint.....C. D. Backus
Rail-tie and rail-fastening, Metallic.....T. M. Lavelle
Rails, Device for preventing the creeping of.....L. P. Bonnell
Railway-rail fastening.....S. G. Crabtree
Railway-rail joint.....H. M. Cosey
Railway-rail joint.....G. A. Binnix
Railway-rail stay.....W. H. Cotton et al
Railway-signal.....M. M. Kane
Railway-spike.....C. W. Stevens
Railway switch and signal apparatus.....L. Griffith
Railway switch and signal apparatus, Safety device for.....L. Griffith
Railway-switch automatic safety attachment.....C. C. and W. L. Bender
Railway switches, signals, &c., Electric apparatus for.....L. Griffith
Railway-tie.....H. H. Ranje
Railway-tie.....C. A. Sims
Railway-tie plate.....J. R. Keller
Railways, Rail-fastener for cement ties for.....F. J. Wright et al
Razor, Safety-.....W. H. Nicholls
Razor, Safety-.....T. F. Curley
Razor, Safety-.....W. H. Crichton-Clarke
Reamer.....C. E. Jackson
Receiving apparatus for pneumatic-despatch systems.....H. D. Waterhouse
Receptacle and support therefor.....J. J. Mahoney
Reflector.....J. Benjamin
Refrigerator.....M. P. Shea
Register-gage and gripper, Automatic.....J. R. Grove
Remedy for poison-oak rash.....A. Terzich
Resinous products capable of replacing natural resins, Manufacture of.....L. Grognot
Retaining-clip.....E. Fleming
Retort, &c., feeding device for.....M. Bittrich
Road grader and scraper.....R. D. Moon et al
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Rolls, Manufacture of.....E. Edmunds et al
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Rope handle, Jumping-.....C. H. Sapper
Rotary cutter.....M. C. Smith
Rotary engine, 2 pats.....P. F. Hodges
Rowboat.....J. Morzinski
Rubber, Apparatus for vulcanizing.....J. R. Gammeter
Ruhber solution, Vulcanizing a.....H. Scherpe
Rubber, Vulcanizing.....J. R. Gammeter
Sack-tie.....J. E. Jamison
Sad-iron.....B. Mumby
Sad-iron holder.....G. W. Pfunder et al
Safety-hook, Readily-detachable.....J. J. Haviside, Jr.
Sample-displaying apparatus.....G. E. Fariss
Sandal, Antislipping.....J. W. Pfersich
Sash-lock.....H. Buttress

Saw-cabinet....C. S. Barger
Saw sharpener, Circular-....C. H. Reynolds
Saw-swage....R. Coyle
Sawmill....F. O. Willey
Scale....E. C. Smith
Screw-making machine....F. O. Curtis
Scrubbing-machine....E. H. Seferian
Scutching-machine....W. B. Gray
Seal-fastening....T. E. Murray
Sealing apparatus, Hermetic....W. A. Lorenz et al
Self-acting fender....L. M. Maxham
Sewer-cleaning apparatus....J. Kelly
Sewing and other machine work-holder....W. W. Sefton et al
Sewing-awl....P. M. Bequette
Shaft....H. Snyder
Shaft, Flexible....E. F. Curtis
Shears....P. H. Melander
Shocks, bundles, and the like, Device for compressing....C. B. Miller et al
Shoe....J. F. Davis
Shoe-scraper....E. O. Wartenbe
Shoe-stitching-machine apron....E. Bayard
Shotgun attachment....O. E. Michaud
Shovel-handle....S. Rogers
Shredding-machine hammer....M. F. Williams
Shunt or electrical resistance....E. Weston
Snutter-fastener bracket....H. Zimmerman
Shuttle....J. C. Nuver
Shuttle-motion device, Positive-....M. T. McMahon
Silicate, Treating aluminum....F. J. Tone
Silicon, Producing....F. J. Tone
Skate, Roller-....J. L. Plimpton
Smoke-condenser....B. P. Hockman
Snap-switch, Rotary....C. A. Clark
Soap cake, Shaving-....L. C. Benitz
Solder for aluminum and other metals....C. G. Carroll et al
Solder-hemmed caps, Making..E. M. Lang, Jr.
Sound-box....W. H. Martin
Sound-regulator....W. S. Cobb
Spark-arrester....O. N. Terry
Sparker device....E. Schietzel
Spinning-ring....J. Pearson
Spinning-spindle....T. M. Byrnes
Spring-looping apparatus....N. S. Harter
Squilgee....A. S. Emerson
Stalk-cutter....F. R. Stillwell
Stamp-applying machine....A. Fiala
Steering apparatus....H. S. Albrecht
Steering-wheel, Adjustable....P. P. G. Hall
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Stone-separator....E. E. Ivory
Stove....J. F. Bowser
Stove attachment....M. A. Halloy
Stove-grate....L. Carr
Stove, Straw-burning....H. C. Ruggles
Stovepipe-fastener....H. H. Akers
Stud, Hair-spring....W. C. Ball et al
Stuffing-box....D. L. Heeter
Sunbonnet....N. F. Winget
Swingletree-hook....B. F. Emery
Switch-stand....J. F. Gurley et al
Table....E. D. Wilde
Table pedestals, Closing and locking device for extension-....C. W. Munz
Table-spread holder....T. A. Hodge
Talking-machine....H. H. Taylor
Talking-machine automatic stop....R. B. Smith
Telephone-line-testing system....W. W. Dean
Telescope, Binocular....E. Bausch
Thermic mixtures, Manufacture of....H. Goldschmidt
Thermostat....A. T. Ziegler
Ticket-holder....B. F. Emery
Ticket or receipt cutter....G. M. Rose, Jr.
Tic-plate....B. J. Coghlin
Time-indicating device....S. P. Thrasher
Tire and rim, Bicycle....S. S. Adams
Tire-guard....C. R. Saunders et al
Tire-protector....H. M. Leese
Tire surface or covering....P. C. Hewitt
Tire wheel, Elastic-....A. D. Foucart
Tobacco-pipe....A. J. Madlem
Tool, Combination-....W. Wrightsman
Tool, Cutting-....J. A. Hess
Tool-holder....F. E. E. Marble et al
Tool-holder....M. W. Murray
Toothpick-boxing machine....C. C. Freeman
Torpedo....P. J. Hedlund
Toy, Wheeled....L. Townsend
Trace....A. Javelet
Track-brace....H. A. Oblinger
Track-fastening and tie....W. J. Girard
Track-sander....J. H. Hanlon
Track-sander....J. Schmitz
Transmitter-bracket....E. S. McLarn
Transom-lift....F. B. La Belle
Trellis, Folding....I. A. Brown
Trestle....G. H. Smyth
Trigger mechanism....E. F. Hedrick
Trolley-contact....A. R. K. Lauder
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Trolley device....F. A. Robbins
Trolley-wire hanger....W. S. Arnold
Trough, Stock-....H. J. Drake et al
Truck....B. Scott
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Trunk-tray....W. P. Fitzgerald
Trunk, Wardrobe-....H. F. von Ohlen
Truss....F. A. Lane
Truss....J. H. Windisch
Tube-making-machine discharge nozzle or former....V. Royle
Tug-loop....W. W. Plowman
Turbine....W. S. Elliott
Turbine....J. Hutchings
Turbine....B. Ljungström
Turbine-blades to their carrying elements, Attaching....S. Z. de Ferranti
Turbines, Condensing apparatus for steam-....G. Huguenin
Turpentine-cup, 3 pats....E. A. McKoy
Turpentine-gathering apparatus...E. A. McKoy
Type-chase....J. S. Duncan
Type-writer shift mechanism....T. L. Knapp
Umbrella attachment....B. M. Nye
Vacuums, Mechanical production of high....J. Zeitlin
Valve, Float-controlled balance-....C. Brossmann
Valve for pneumatic tires, 2 pats....H. K. Raymond
Valve-operating mechanism, Electromagnetic...J. B. Struble et al
Valve-stem packing....E. P. Coleman
Vats, Manufacture of indigo-white preparations suitable for fermentation-....A. Schmidt
Vegetable-slicing machine....J. J. Vavruska
Vehicle....W. G. Polsgrove
Vehicle friction-drive, Motor-....V. Bendix
Vehicle, Power-driven....C. Elkin
Vehicle-seat....W. Meredith
Vehicle shock-absorber....E. E. Lantz
Vehicle-spring....W. W. Blair
Vehicle, Toy-....J. M. Thompson
Vehicle, Tram-car or other like....J. E. Anger
Vehicle-wheel....J. B. Barnes
Vehicle-wheel....T. J. Furphy, Jr.
Vehicle-wheel....W. O. Kennedy
Vehicle-wheel rim....E. C. Shaw
Vehicle wheels, Antiskidding tread for motor-....W. A. F. McCallum
Vehicles, Device for detaching horses from....R. E. Lawrence
Velocipede....R. B. Robinson
Vending machine, Newspaper-....C. F. Pohl
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Ventilating-cowl....T. E. Lewis
Victoria and buggy top....J. W. Woolley
Vise....H. R. Christians
Voting-machine....F. Keiper
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Wagon brake and lock, Combined....C. T. Lyon et al
Washboard....L. H. Percy
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Watch, Stop-....S. Fischer
Water-closet....J. W. McAuliffe
Water-closet....F. J. Torrance
Water-closet bowls, &c., Temporary closure device for....H. A. W. Spencer
Water-elevator, Compressed-air..R. M. Downie
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Wattmeters, Process and apparatus for testing....E. M. Wilkins
Wheel....J. D. Behrens
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Whip-socket....G. F. Stanfield
Window-cleaner....H. J. Spoorendonk
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Window-sash lift and fastener....J. Keller
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Wire-bending machine....W. A. Perkins
Wire-reel....J. Ziegler
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Wire stretcher and fastener....L. Eckert
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Wrench....G. A. Cutter
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Wrench....F. A. Bronchain
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Zinc oxids, Reduction of....P. Brangier et al

DESIGNS.

Box....G. A. Krutschnitt
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Medicine-dropper....O. F. Hall
Neckwear fabric....J. E. Kirberg
Picture, Framed....A. Abbaticchio
Work-stand....L. J. Heffron

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Acid, Acyl derivative of para-aminophenylarsinic....P. Ehrlich et al
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Advertising device....J. P. Ryan
Air-pipe automatic coupling....C. W. Sheeler
Air-ship, Dirigible....R. C. White
Air-ship, Self-propelled....G. Pum
Air, steam, and signal coupling....E. B. Witte
Alarm-signal....T. N. Burke
Alloy....W. Rübel
Aluminum solder....H. B. Lambert
Amusement apparatus....J. A. McDonagh et al
Amusement device, Puzzle....P. G. Watmough, Jr.
Automobile antiskidding shoe..G. W. Constable
Automobile-curtain button-fastener....A. Bessette
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Barrel-trussing machine, Horizontal....E. F. Beugler
Battleship protection by means of concrete....L. d'Adda
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Belt attachment....C. E. Smith. (Reissue.)
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Bottles, jars, or like receptacles, Cap or closure for....C. Hammer
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Car draft structure and draft-beam cap....T. L. McKeen
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Car pneumatic safety appliance....A. J. Thornley
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Coupling-centering and draft-rigging device...W. R. Matthews
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Curtain drying and stretching frame, Lace-....G. F. Hullings. (Reissue.)
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Cycle-saddle clamp....F. Weihn
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Dental instrument....R. T. Burnley
Dental-plate suction device....G. S. Whittaker
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Display-rack....E. B. Weston
Ditching-machine....W. Krueger
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Doll knee-joint....G. Scherf
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Door-check....J. P. Dengler
Door check and lock....O. Pearson
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Draw-bar, Slack-adjusting....E. Ryan
Drawing-board attachment...A. J. Bechtold, Jr.
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Election-booth....G. A. Gohen
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Envelop, Safety-....J. S. Horton
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Ester, Diaminobenzoic-acid alkamin....A. Einhorn
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Evaporator or heater, Vacuum....J. E. and F. M. Dunn
Exerciser....A. Limoges
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Eyeglass-case-covering machine....A. Axell
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Film-handling device....T. S. Graves
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Furnaces, Apparatus for handling matte and slag of copper blast-....G. K. Fiseher
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Gas, Producing....C. J. Greenstreet
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Gas-regulator....O. W. Lutz
Gas-retorts, Centrifugal machine for feeding....C. Eitle
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Gasolene-engine....C. S. Cole
Gate....J. J. Carrigan
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Harness attachment....E. W. Hargiss
Harness-check....W. C. and H. A. Mitchell
Harrow, Disk....W. H. Cole
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Hasp-lock....A. L. Jervey
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Hay-rake, Folding sulky....W. S. Clark
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Ice-cream packer....E. C. A. Johnson
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Indicator....H. M. Bell
Injector....S. L. Kneass
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Jet-photometer....L. E. Knott
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Labeling-machine....F. H. House et al
Ladder, Fire-escape....H. C. Sponholz
Lamp and lantern....C. Bergener. (Reissue.)
Lamp, Electrical incandescent....W. Nernst
Lamp-extinguisher, Automatic....C. Older et al
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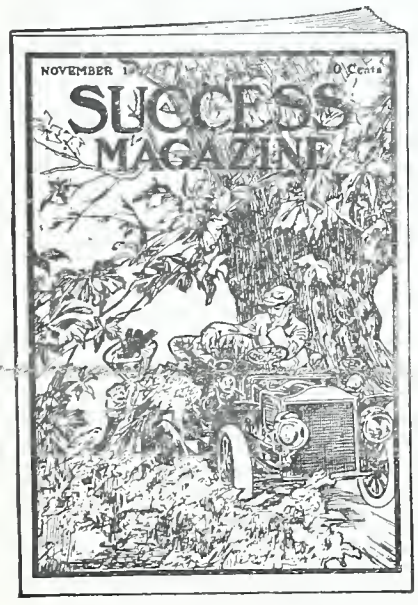


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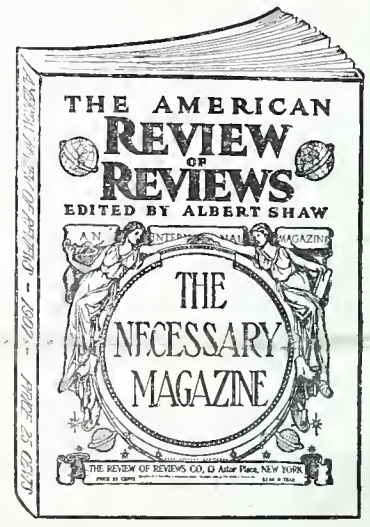
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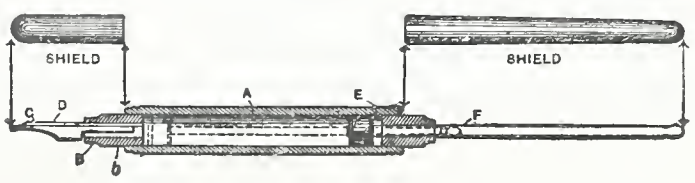
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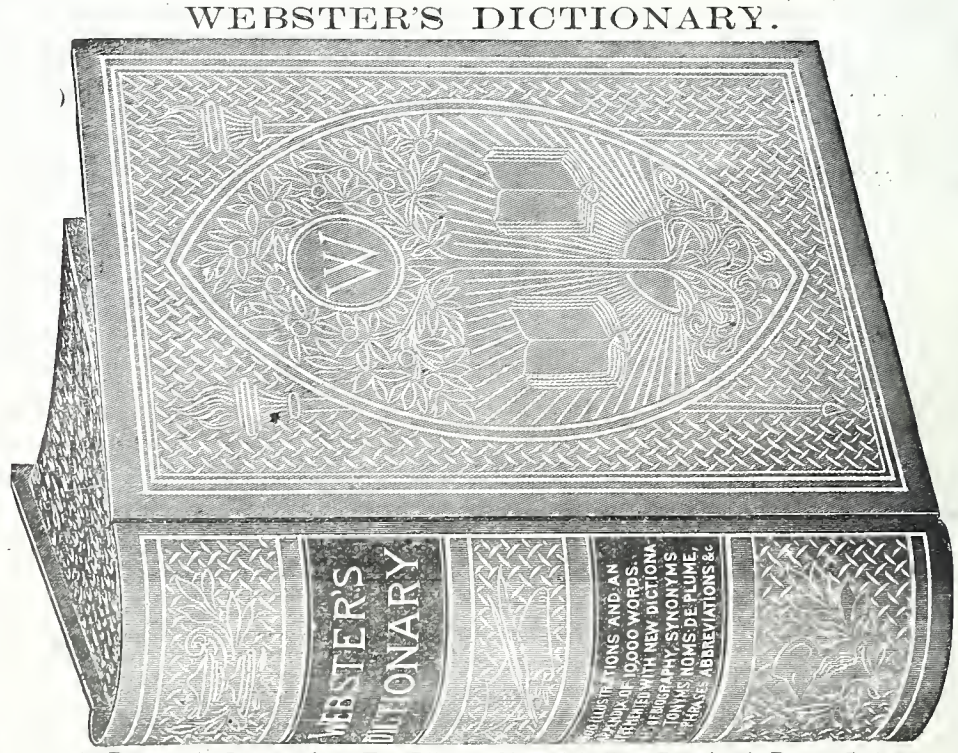


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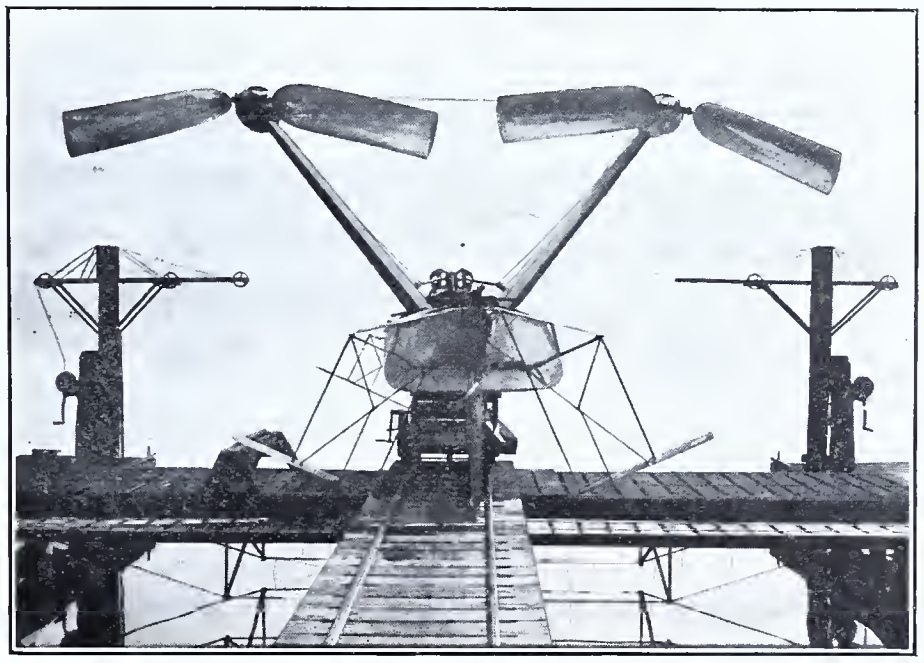
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NEW HYDROPLANE BOAT.

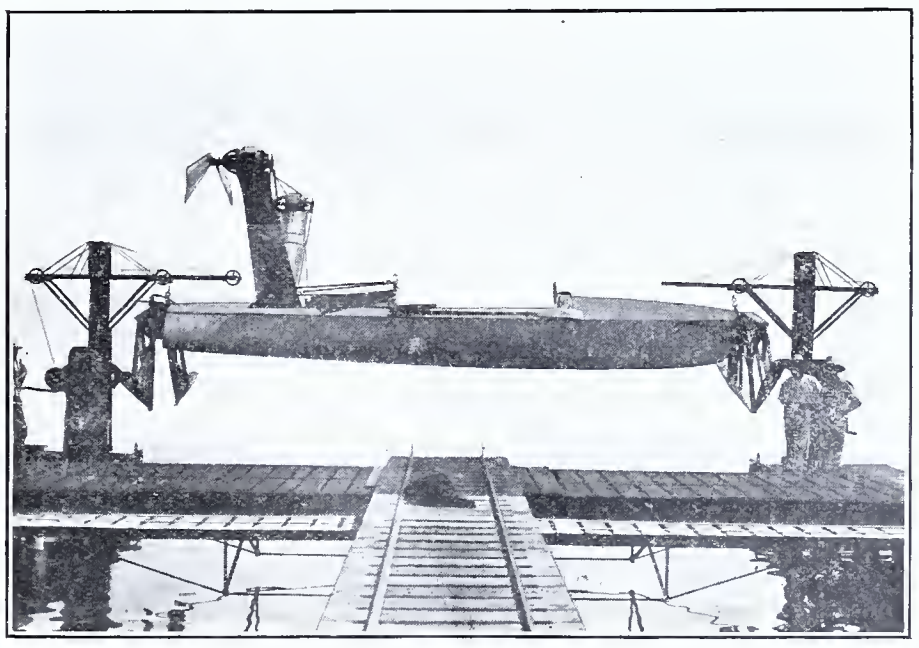
By E. OMMEGANCK.

THE hydroplane, or gliding boat, has been occupying considerable attention of late, because of the remarkable performances of a vessel built by a Frenchman, Count de Lambert, which, in a race on the Seine near Paris, outdistanced all its competitors, including a number of boats constructed especially for racing but without the hydroplane. This directed public attention to this class of craft, as it had not been previously known what was to be expected of this peculiar form of construction. There are now several varieties of hydroplane vessels, but the fundamental principle of all of the recent forms is the same: to make the boat glide upon the surface of the water with little or no immersion of the hull—the latter condition being the ideal and the theoretical one. This result is accomplished by giving the boat sufficient speed from the employment of a light but powerful gasoline motor, and at the same time using planes underneath, which are slightly inclined and turned upward from the back to the front, so that when the boat reaches a sufficiently high rate of speed, the action of the planes causes it to be lifted out of the water. The first experimenters in this line used a boat of ordinary section, and adapted underneath it a set of separate planes, whose angle was adjustable; but the present day boats have the plane surfaces formed simply by the bottom of the vessel, this being constructed so that there are at least two surfaces of this kind. What is essential for the hydroplane action is to have the boat light enough to be lifted easily out of the water and at the same time to provide sufficient power to give it the proper speed for bringing about the lifting action. This is now easy to accomplish in the present state of gasoline motor construction, especially since the new light weight motors for aerostatic purposes have been brought out. In the early days, inventors were handicapped, since they had only steam engines available and thus heavy weights had to be lifted out of all proportion to the power the motor could give.

The Lambert boat made the record for speed in the race mentioned—25 miles an hour. It carried three persons and was obliged to make a number of turns, which are a decided disadvantage for this class of craft. In a straight line, the inventor claims, 34 miles an hour can be made. He is now constructing a new hydroplane even simpler in form. It is made of a series of box floats placed between two long timbers on each side. Each float has the required plane surface on the bottom, and the assemblage of floats forms a kind of raft, which has a number of gliding surfaces.



END VIEW SHOWING PLANES AT STERN.



SIDE VIEW, SHOWING PLANES AT STERN AND BOW READY FOR LAUNCHING.

Two Italian officers, Lieutenant Crocco and Captain Ricaldoni, are making experiments with a hydroplane motor boat which presents some original features, illustrations of which we here produce.

The boat is provided with hydroplanes only at its stem and stern. The planes at the bow are arranged in the manner of a V, while those aft, though similarly disposed, do not join at the inverted apex. These planes and the principal members of the frames supporting them, are made of steel, the rest of the carrier frames being of aluminium.

The length of the boat is 26 feet 3 inches, and she is fitted with a 80-100 horse-power motor, working at a speed of 1200 revolutions per minute.

The propellers (see figures) are mounted on frames of aluminium sheeting, which, together with the shafts, gear, transmission, controlling devices, &c., weigh 660 lbs. The weight of the motor is also 660 lbs. Including all machinery, fuel, &c., and two men on board, the vessel weighs 3300 lbs. When running, the boat rises, so that the hull is clear of the water, and at the speed of 43 miles per hour—which has been obtained with this novel form of vessel—the hull is about 18 inches out of the water.

The inventors state that on commencing a run, when a speed of about 6 miles per hour is attained, the bows begin to lift in the water, and the fore fins slowly emerge as the speed increases. At a speed of 15 miles the hull is wholly out of the water, only the flat portion near the stern skimming on the surface. At from 18 to 22 miles the boat is supported solely by the V-shaped planes; and at the high-

est speed yet attained the hull is, as already stated, 18 inches out of the water. It has been found that waves 8 inches high do not affect the vessel, as at full speed the hull stands quite clear of waves of this size. Trials covering a distance of 4 miles have been made, and sharp turns have been taken while running. The inventors propose to put the boat through more exhaustive experiments, under as varied conditions as possible.

The illustrations show a side view of the vessel, on a railway in position for launching, and also show an end-on view, depicting the V-shaped plane and the aerial propellers at the stern.

Making Matches.

Three million matches are struck into fire by the civilized nations of the world in every minute of the twenty-four hours. Nearly one-half of this number is used in the United States. Americans burn the enormous total of seven hundred billion lucifers in every year, and have a larger match bill than any other country on the globe. To supply this huge demand, hundreds of factories all over the land are kept busily employed. Some of the plants are very large, one on the Pacific Coast covering an area of 240 acres, with 32 miles of railroad which carry 200,000 feet of timber a day to the manufactory.

A statement of the number of cubic feet of wood which is actually converted into matches each year would convey only an inadequate idea of the nnmber of trees required for the industry. For the manufacture of the match the best grade of wood is required. It might be thought that because the object is small, scraps and knots could be utilized; but the best forests must be searched and the choicest trees selected for this small but important article of commerce. Seldom is the little splinter tipped with an ignitible substance given mention, in the consideration of the depletion of the world's wood supply; yet the manufacturers of these tiny fire sticks are as much concerned in this question as any other class of men whose industry depends on forest products.

Matches are manufactured in many ways and with numerous kinds of machines, and a description of an operation in one factory would not apply to another. Almost every company has machinery made especially for its own use, and it also employs processes discovered or devised by its own chemist and mechanics, and kept secret to prevent rivals from profiting by them. A single machine has been known to turn out 177,926,400 matches in one day—boxed and labeled ready for shipment. Some matches are shaved with the grain from sawed blocks, some are cut both ways by saws. In some factories the blocks are boiled to make them cut easily. By other machines a boiled or steamed log is revolved on its own axis, and a shaving—the thickness of a match—is cut round and round. This shaving is at the same time cut into lengths and split into match sticks. There is hardly a limit to the varieties of methods employed. Round matches are made by forcing them through dies. The Japanese make paper matches, but these are wood after all. The timber left over after the matches are made is worked into other articles. As a matter of fact, it would be impossible to carry on the match business at all, at prices now prevailing, if it were not for these by-products. Often this branch becomes the largest end of the match business, so far as bulk is concerned.

SELF-REGISTERING TARGET FOR RIFLE RANGES.

At the Bisley rifle meeting in England last year, interest was centered in a new type of self-registering electric target, invented by Lieut. Col. George A. Peters, of the Canadian Army. This apparatus has been designed for the purpose of securing an immediate and accurate record of the shot fired, dispensing with the attendance of markers, two of whom are ordinarily required. In this self-registering target there is a face-plate of solid steel which, through the agency of certain mechanical devices distributed over its posterior surface, is capable of responding in sections. When a bullet strikes any part of the target, the corresponding unit behind the plate is set in operation, in such a way that an electric circuit is closed, and a disk on an indicator, similar to that employed in connection with electric bells, is exposed at the firing point.

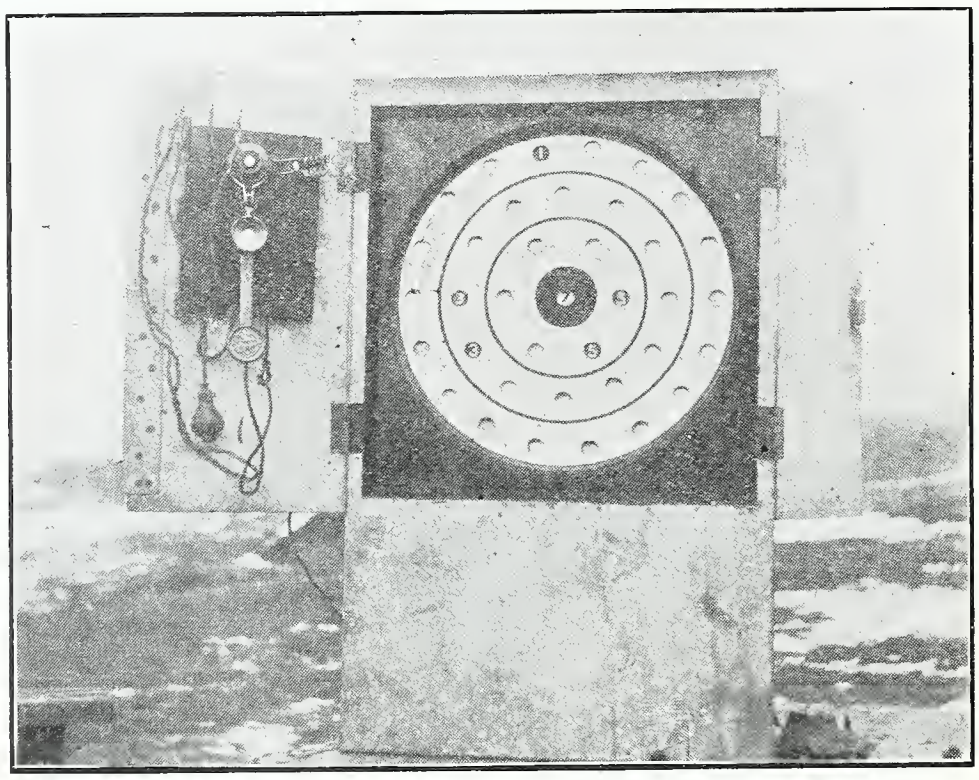


FIG. 1.—TARGET SET UP IN POSITION.

The main framework of the target (Fig. 1.) is composed of a pair of substantial upright standards connected by cross-beams, and furnished with bases which are firmly bolted to a square horizontal platform of heavy timber. The target itself is swung upon the standards by means of a rocking frame, the front arms of which are mounted on pivots near the four corners of the plate.

The rocking frame is designed upon tbe principle of parallel motion levers, by means of which the plate as a whole can be raised and lowered in the direction of the arc of a circle, having a radius equal to the length of the arms of the rocking frame—this length being also equal to the radial length of the hammers—without altering the vertical position of the frame. By this means, the plate may be brought nearer to or removed farther from the back plate supporting the hammers without distributing the vertical position. The presence of the rocking frame enables the target to be made adjustable for various weights and velocities of ammunition, while it is also through the movement of this section that the working integrity of all parts of the target may be tested.

The target plate is constructed of three layers of chrome steel, alternately hard and soft, as adopted in the laminated construction of burglar-proof safes. When the range exceeds 100 yards, but little impression upon its surface is made by the bullets.

The plate supporting the moving hammers is composed of mild steel about a quarter of an inch in thickness, and is pierced by a series of oblong slots for the reception of the hammers, which are supported by lugs obtained by simply bending up the strips of plate from the sides of the slot. The hammers are placed in concentric circles about the central one, which corresponds to the "bull's eye." Each hammer is supported upon the back plate by a pivot which passes horizontally through it near its rear extremity. The opposite end of each hammer is provided with a rounded head, and this rests normally against the rear face of the target plate. The backward motion of the hammer, however, is regulated by means of a shoulder, which insures that the center of gravity of the hammer piece is always in front of its supporting pivot, so that after being driven backward by the impact of the bullet striking the target, it immediately falls into its normal position against the target plate.

The end of the hammer projecting beyond the point where it is pivoted is provided with a tail or spur, which projects almost vertically upward when the hammer is in the normal position. When, however, the hammer is forced backward by the impact of the bullet, this spur moves in a circular direction backward, and establishes sliding electrical contact with a slender insulated brass spring connected by wire with the annunciator. This contact continues until the hammer begins its return movement. It will thus be seen that a length of contact is obtained which is considerably in excess of that required to cause the corresponding indicator upon the annunciator to drop. One of the leads of the electric cable is soldered to each brass contact, while earthing is obtained by soldering the wire to some portion of the supporting plate, thereby forming a complete electrical circuit, broken only between the hammer spurs and their respective brass springs. The battery is located at the annunciator end of the cable. When one hammer is moved and an electrical connection established, the corresponding magnet on the annunciator is energized and the indicator falls, recording the result of the shot fired.

The annunciator is constructed of galvanized iron with a waterproof case, and incloses a number of electro-magnets arranged in concentric circles to conform to the arrangement of the hammers of the target. Each of the electro-magnets, when energized, operates a very simple form of corresponding gravity drop. The groups of indicators in the respective rings carry the customary scoring number.

The annunciator is equipped with a restoring mechanism which is operated by a strong magnet, so that after the drops have fallen, the simple pressing of a button resets the apparatus.

When a bullet strikes the plate, no appreciable movement of the whole results, but the impact sets up a bulging over a certain circumscribed area, around the point where the missile strikes. Should this point be immediately opposite one of the hammers, that hammer only will be forced backward. At the same time, it is obvious that the area to which any hammer will respond will be circular in outline, and it is equally obvious that the disposition of the hammers must be such that the circular areas must overlap one another (Fig. 2.) so that no dead spaces are left, which

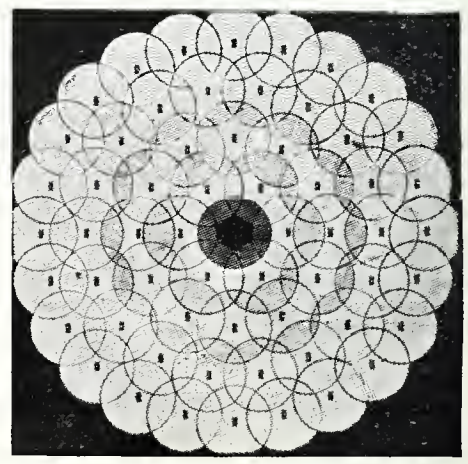


FIG. 2. — SHOWING CIRCULAR SERIES OF HAMMERS.

would be irresponsive to the impaet of the bullet. Therefore, should the bullet strike the target in the space where two hammer areas overlap, both hammers will be affected and driven back, and their corresponding indicators on the annunciator will fall. Similar results will attend the strik-

ing of the target at those places where three and even four fields of influence overlap, so that it is possible for four indicators to be exposed as the result of one shot. At first sight, this circumstance might appear to militate against the utility of the apparatus for scoring purposes, but as a matter of fact, it assists appreciably in the localization of the shot.

Ricocheting shots, which often enter into the scoring with canvas targets, are with this apparatus eliminated, since they have not sufficient momentum when finally striking the target to force the hammer back far enough to make the necessary electrical contact. At the present time, all "bull's eyes" are placed on an even basis in scoring, and in rifle competitions ties often result, simply because there is no fair way of discriminating between the marksman who strikes the dead center of the "bull's eye" and the one who strikes it upon the circumference of its area. With this apparatus, however, it is quite easy to make such distinctions.

Upon rifle ranges where a series of targets may be required, each target is provided with its own annunciator at the firing line, but a cable with a single set of wires will suffice for an unlimited number of targets, provided there are as many wires in the cable as there are hammers or groups of hammers in any one target, besides a ground wire for each target. This equipment would enable all the targets to be in operation at the same time without the possibility of one interfering with the other, since it is apparent that each annunciator will respond only when the circuit is completed through its own ground wire.

A THREE-CORNERED DRILL THAT BORES SQUARE HOLES.

A three-cornered drill that bores square holes and that can moreover be used on any ordinary lathe, drill press, or milling machine, is one of the latest mechanical wonders introduced from abroad. That it will have a wide field of application is apparent when we consider the great number of square holes employed in wood-working, stone-working and metal-working. Ordinarily, these holes are first bored round and then worked out square, either by laborious hand-work with a chisel and file, or upon slotters or similar machines, whereas the new machine bores a square hole in the first place nearly as rapidly as a round drill can bore a round hole. Not only this, but the same idea can be applied to drilling triangular holes, and holes with five, six or more sides as desired. The device by which these wonders are performed is really very simple, consisting of a special drill, three-cornered in the case of square holes, and a special chuck for holding this tool, which is fixed on the ordinary lathe or drill press. (Fig. 1)

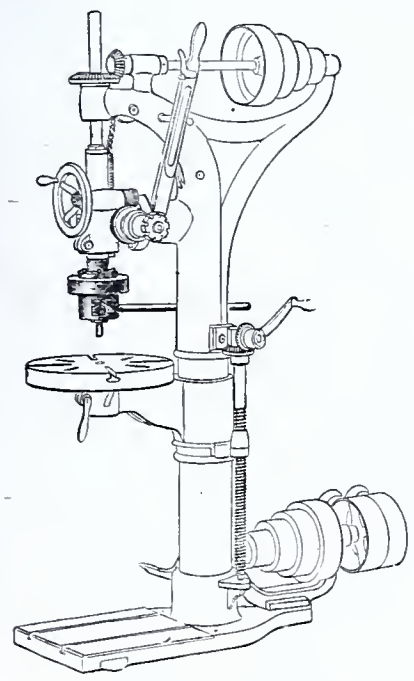


FIG. 1.

This chuck contains three parts that move independently of one another. First, a part which screws onto the spindle of the drill and revolves with the latter; second, a stationary part which rides upon the part first mentioned; and third, a holder into which the shank of the drill is screwed.

This holder is caused to rotate with the part first mentioned, but is at liberty to move sidewise a certain distance in any direction. Its exact motion is determined by a guide in the second part of the chuck, which surrounds the shank of the drill. The shank of the drill is three-cornered but not exactly triangular, that is, the three sides are convex, (Fig. 2.) being formed by arcs of circles struck from centers at the opposite corners. The three-cornered shank just fits into the square guide, and as the shank turns about in the guide which is held stationary, the three corners of the shank in turn enter into each of the four corners of the guide. At the same time, the three corners of the cutting head strike out the sides of the work. It should here be explained that the cutting edges are on the end of the tool, not on the side, being in this respect similar to the ordinary twist or flat drill. For drilling holes of different sizes only one chuck is required, the guide in the chuck being so constructed that the opening can be enlarged and diminished by turning the key.

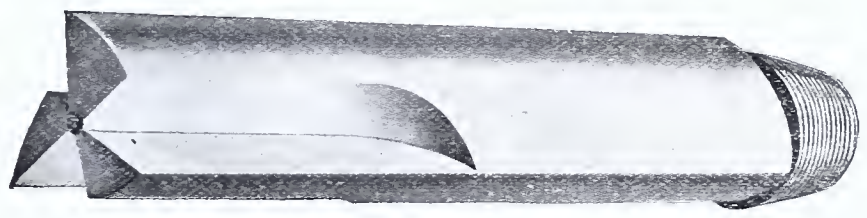


FIG. 2.

The motion of the three-cornered shank of the tool within the square plate can be be better understood when it is remembered that the radius used to strike out the three sides of the shank is just equal to one of the sides of the square formed by the guide. Therefore, if one side of the shank is rolling or sliding on one side of the guide, the opposite corner of the shank will be moving in a straight line corresponding to the opposite side of the guide, *i. e.*, during a certain part of the revolution the corners of the tool travel in straight lines, along the outside of the square. By trying this with a small model, it will be found however that there is a small space in each corner where the rolling motion ceases, so that the corner is blunt and not sharp.

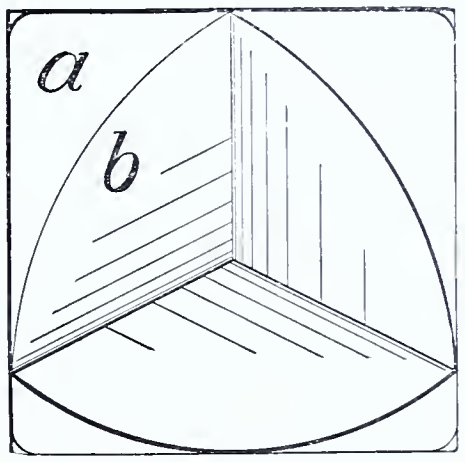


FIG. 3.

While blunt cornered holes are satisfactory for the great majority of uses, there are cases where a sharp cornered hole is desired, and this is secured by a special construction in which the tool is made smaller than the shank and one of the corners of the shank is rounded. (Fig. 3.) The exact shape of the shank in this case has been determined by a careful cut-and-try method, and as templets have been made for each size, any number of tools can be duplicated in the right shape and size for each size of hole to be bored.

The obvious utility of this invention will be apparent to anyone who works in wood, iron, brass, stone or other materials. Hundreds of the appliances have been sold in Germany, and companies have been established in other countries, notably France and England, for the introduction of the device there. Among the German users of the machine are such firms as Friedrich Krupp, Siemens & Halske, Schuette & Koerting, etc.

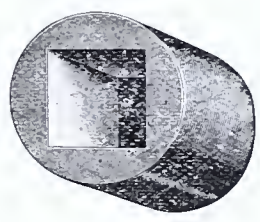


FIG. 4.

For the introduction of the device in this country, a concern has been organized under the name of the Radical Angular Drill Co., which has established offices and has a machine on exhibition at 114 Liberty St., New York City. At this place a milling machine has been fitted up with one of the chucks, which, however, is of such a type that it could be applied to a drill or lathe with equal facility. Where the chuck is to be used on a machine regularly and continuously, it is possible to simplify the construction somewhat by making the stationary part of the chuck a permanent part of the machine.

MOVING TREES WITH CRANES.

It is reassuring evidence of the growing interest in forestry, that in a number of recent instances when it was found necessary to remove trees, they have been carefully transplanted instead of ruthlessly cut down, as would have been the case a few years ago. In one case in Germany which received considerable attention from the press, a noble elm was transferred a distance of several hundred yards, out of the way of a proposed thoroughfare. The roots were first cut around, care being taken to avoid severing any of the tendrils, and the ends were tied up so as to more effectually protect them. Although the tree was very large and at least a hundred years old, the operation was effected with entire success, and it is now flourishing in its new location. A somewhat similar task has just been undertaken in New Jersey. During the extension of a manufacturing plant at Ampere, it became necessary to build the yard tracks over the place where several fine oaks stood, and rather than destroy them, the company undertook to transport them to other places by means of locomotive cranes. The accompanying illustration shows the crane in the act of transporting a tree 60 feet in height and about 18 inches in diameter, with a ball of earth and roots 15 feet in diameter. As a preliminary precaution, the bark was protected by burlaps wrapped around the trunk at the spot where the crane was made fast. The height of the tree made it difficult to calculate the centre of gravity, and a large block offset was found necessary to keep the tree upright against the uneven distribution of weight. It was moved several hundred feet, and, as well as the other trees, replanted successfully.

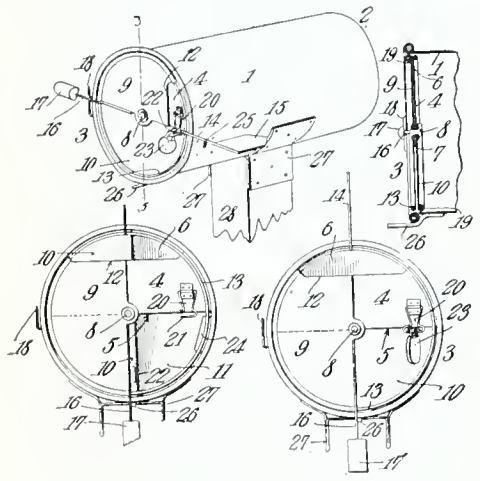


CLEVER NEW PATENTS.

Mail Box.—Baseball Game.—Tire Shrinking Machine.

Mail Box.

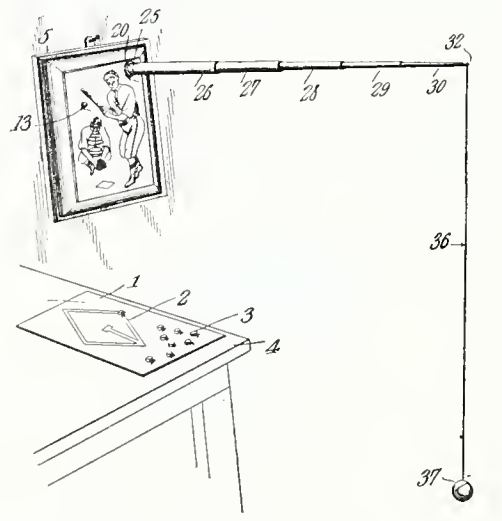
With the wider and wider extension of rural free delivery has come a new industry—the manufacture of mail boxes for these special routes. John T. Denny, of Cromartie, N. C., is the latest to invent a device of this character, which is water tight, strong and yet simple in construction, and arranged to automatically display a signal when there is mail in the box for either owner or carrier, and to lower said signal when the box is empty. It comprises a cylindrical casing closed at one end and provided at the other with means for covering and uncovering the mail depositing and collecting openings, operating the signal flag and locking the door.



Extending across this end is a plate 4, the lower edge of which coincides with the horizontal diameter of the cylinder. This plate, 4, extends up about two-thirds of the radius of the cylinder, leaving a space large enough to deposit mail. On the bottom edge of the plate is a lug with an axial opening for a pivot pin, common to two oscillating doors 9 and 10 for covering the depositing and collecting openings 6 and 11. The door 9 is a flat, semi-circular plate outside the plate 4, part of one side being removed so that when turned about the pivot pin 8 to expose the drop opening 6, the edge of said plate will coincide with the adjacent upper edge of the fixed plate and open the slot 6. The outer curved edge of the closure 9 lies close to the inner wall of the cylinder, and is fastened to a circular ring 13 concentric with the pivot pin 8. To the ring is secured the staff 14 of the signal flag 15, in line with the diametrical edge of said door; and fixed to the door in line with the flag staff but on the opposite side of the pivot pin 8, is a rod 16, extending out and provided on its end with a weight 17. A spring catch 18 retains the rod when the door is moved to cover the drop opening 6. In this position the signal flag is depressed out of sight. The door 10 of the collecting opening is on the inner side of the plate 4, and has its peripheral edge secured in the same way as the door 9. Means for locking are provided on the plate between the edge of the door 9 and the cylinder. When the box is empty, both openings will be closed, the flag will be depressed and the weighted rod will be held in horizonal position. If mail is deposited, the catch is moved to disengage the rod so that the weight drops and turns the door 9 into position, as shown in the drawing. This oscillation elevates the signal flag into view. When the mail is to be collected, the door 10 is unlocked, and turned a half revolution, so uncovering the collecting opening 11. This movement by striking the edge of the door 9, causes the arm to be again caught by the spring catch. The mail being removed, only the door 10 is returned and locked, leaving the door 9 covering the deposit opening and the flag lowered.

Baseball Game.

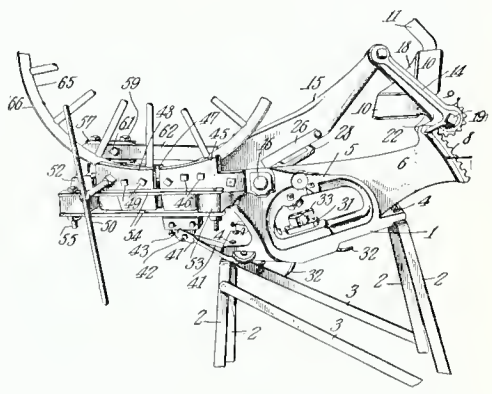
Interest in the national game is so widespread that young America will hail the opportunity to play it indoors. An ingenious device, invented by Cyrus Wm. Courtney, of Grants Pass, Oregon, provides a game in simulation of baseball, adapted to be played in a room and by two players, and difficult enough to involve a considerable amount of skill. The apparatus comprises a game board with the usual diamond thereon, and a number of men, which may consist of small blocks of wood or be of more elaborate design. Each player has nine men. A board depicting the batsman and catcher is attached to the wall, and it contains a bell or other means which when hit by the ball gives a signal. Attached to the board is a rod, preferably telescopic for compactness, so that it may be reduced to a length not exceeding that of the board, or extended to several feet. This rod is hinged, so as to be turned down in packing, and at its



end is a cord with a ball at its free end. When the rod is extended horizontally and the ball is swung through an arc with the end of the rod as a center, the ball will engage with the signal means without coming in contact with the board. The game is played by the player swinging the ball and attempting thereby to actuate the signal, and success or failure counts as a hit or strike, the whole proceeding under the general rules of baseball. If he hits the head 13 and so rings the bell, one of his men, on the game board, is placed upon first base. If he misses it counts as a strike, and if the ball on the return movement hits the bell, as a foul. When a player has struck out or made a base run, the next player takes his turn. Nine innings of course constitute a game. The device is adapted to give much amusement to grown-ups as well as to children.

Tire Shrinking Machine.

An improvement in combined cutting, punching and tire shrinking machines has lately been patented by Wm. T. Sears, of Onslow, Iowa. It is particularly applicable to use in blacksmith shops and similar places, where the taking up of loosened tires and the punching and shearing of metal are operations frequently performed. By the structure of this invention, these several operations are



combined in one machine and under the control of one set of operating parts. The device consists essentially of a suitable stand upon which are mounted stationary and movable shear-blade carrying arms, which arms also carry the two members of a suitable punch, and in addition there is provided a tire shrinking device connected to and movable by the same mechanism operating the shear and punch. Referring to the drawing, which shows a small section of a wheel with the tire in place, it will be seen that the invention comprises a bed member with an arm 6 provided with rack gear teeth, which are engaged by a pinion carried by the free end of links 14. These links have lugs on their free ends engaging behind ledges on the bed member, so that the pinion 9 is constrained to travel over the gear segment 8, with its teeth in mesh with the same. The pinion has divergent sockets formed thereon, one of said sockets being adapted to override the end of the bed member and extend between the links and thereby constitute a weighted extension for said pinion, constrained by gravity to hold the pinion in inactive position. On the bed member is a block 31, the arch 5 above which is formed with lugs between which is seated a block guiding a longitudinally movable punch-holder with a punch at its lower end, and its upper end connected by a link with a head seated in a socket in the arm 15. When this arm is moved about its pivotal support, the punch holder may be moved longitudinally through the intermediary of the link, which permits the change of motion between the arc described by the head, and the rectlinear movement of the punch holder.

The bed member has two pair of clamping jaws, one of which, 47 and 48, is shown in the cut. This pair is movable with relation to the first pair, and a lever engages the end of the movable jaws remote from the fixed jaws. When the arm 15, which is pivoted to the arch 5, is moved in a direction to cause it to approach the arch, the angle extension of this arm is moved away from the block 52, but because of the link connection, the corresponding end of the block is forced to move with the angle extension in the same direction. However, the other end of the block is held by straps, and so the block operates as a short lever upon the jaws 47 and 48. Since these jaws are movable toward the other pair, the movement of the block will cause the approach of the two pairs, and a tire clamped between them is upset by their approach.

PATENTS

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LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

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RUDOLPH WURLITZER CO. v. SHEPPY.

(Circuit Court, N. D. Illinois, E. D. Oct. 24, 1907. 156 F. R. p. 585.)

PATENTS — INFRINGEMENT — PHONOGRAPH TONE-REGULATOR.

The Robinson patent, No. 831,188, for a phonograph tone-regulator, which consists of an independent device adapted to be inserted between the parts of a phonograph sound-conveyer, discloses invention, and is valid. Also, held infringed.

UNDERWOOD TYPEWRITER CO. v. ELLIOTT-FISHER CO.

(Circuit Court, S. D. New York. Sept. 13, 1907. 156 F. R. p. 588.)

1. PATENTS—INFRINGEMENT — TABULATING ATTACHMENT FOR TYPEWRITERS.

The Gathwright patent, No. 435,916, for a tabulating attachment for typewriters, construed, and held infringed on a motion to punish a defendant for contempt in violating a preliminary injunction restraining it from infringement of such patent.

2. —SAME — SUIT FOR INFRINGEMENT IMPOUNDING OF INFRINGING ARTICLES.

A court of equity has power on a preliminary motion in a suit for infringement of a patent, when a prima facie case is made, to order the marshal or a receiver to take possession of infringing articles in the possesion of defendant, and to hold them until a final decree.

3. SAME—INFRINGEMENT—SALE AFTER EXPIRATION OF INFRINGING ARTICLE MADE BEFORE.

The making of articles which infringe a patent during the existence of the monopoly which is created by that patent is in violation of the patent law, and infringing articles so made during the life of a patent cannot lawfully be sold after its expiration.

AJAX FORGE CO. v. MORDEN FROG & CROSSING WORKS.

(Circuit Court, N. D. Illinois, E. D. Oct. 24, 1907. 156 F. R. p. 591.)

1. PATENTS—INFRINGEMENT— COMBINATION PATENT.

A patent for a combination is not infringed by using one element of such combination as an element of a different combination.

2. SAME—SWITCH-ROD.

The Elfborg patent, No. 640,456, for an adjustable switch-rod in which an eccentric is used as means for adjusting the length of the rod in a split switch, is not a pioneer patent, but the device shown differs from prior devices only in the specific locking means employed, and, in view of the narrow construction required by the prior art, the patent is not infringed by the device of the Lee & Moore patent, No. 679,153.

AJAX FORGE CO. v. MORDEN FROG & CROSSING WORKS.

(Circuit Court, N. D. Illinois, E. D. Oct. 24, 1907. 156 F. R. p. 594.)

PATENTS—INFRINGEMENT—SWITCH-ROD.

The Elfborg patent, No. 768,591 and No. 768,592, for switch-rod mechanism, construed, and, as limited by the language of their claims and by the prior art, held not infringed.

BENDER et al. v. ENTERPRISE MFG. CO.

(Circuit Court of Appeals, Sixth Circuit. Nov. 8, 1907. 156 F. R. p. 641.)

TRADE-MARKS AND TRADE-NAMES—UNFAIR COMPETITION—REPAIR PARTS FOR MACHINE.

The mere making and sale of repair parts for a well-known machine, the patents on which have expired, by other than the patentee and maker of the machine, which also makes and sells such repair parts, is not an act of unfair trade, unless they are put out as the goods of the original patentee, and especially where they are unmarked, while those made by the patentee are marked with its name.

COOPER v. OTIS CO.

(Circuit Court, D. Massachusetts. Nov. 11, 1907. 156 F. R. p. 665.)

1. PATENTS—INFRINGEMENT—KNITTING MACHINES.

The Hurley patent, No. 572,679, for improvements in circular knitting machines used for knitting ribbed fabrics which employ two revolving needle cylinders, one above the other, describes as the substantial improvement intended to be covered, such a construction of the machine as to enable the finished work to be taken up either above or below the cylinders, and an essential feature of such construction is the making of the two cylinders of the same size and form. As so construed the patent held not infringed by a machine in which the cylinders were not of the same size or form.

2. SAME—CAMS FOR KNITTING MACHINES.

The Barratt patent, No. 601,408, for an improved cam for circular knitting machines, strictly construed as required by the prior art, held not infringed.

PIEPER et al. v. ELECTRO DENTAL MFG. CO.

(Circuit Court, S. D. New York. Sept. 26, 1907. 156 F. R. p. 672.)

PATENTS — INVENTION — REGULATOR FOR ELECTRIC MOTORS.

The Pieper patents, No. 704,099 and No. 721,229, for improvements in electro-motor regulation, are void for lack of invention, the only novel feature being a permanent shunt around the armature in an alternating current motor to control the motor at any speed and maintain a uniform speed, which device had previously been used in direct current motors, and the transfer from one class to the other not involving invention. The second patent is also void for anticipation by the first.

GEORGE FROST CO. v. E. B. ESTES & SONS.

(Circuit Court, D. Massachusetts. Oct. 30, 1907. 156 F. R. p. 677.)

TRADE-MARKS AND TRADE-NAMES—UNFAIR COMPETITION—IMITATION OF PATENTED ARTICLE.

Complainant, as exclusive licensee, manufactured a hose supporter having a rubber button for attachment to the hose which was protected by a patent, and advertised and sold its supporters under the trade-name of "Velvet Grip." Defendant made and sold wooden buttons or collets intended for similar use, colored in imitation of rubber, and used on hose supporters which were sold by dealers as rubber button supporters, and sometimes as "Velvet Grip" supporters. Held, that such sales constituted unfair competition, and that defendant was chargeable as contributor thereto and would be enjoined.

DETRICK & HARVEY MACHINE CO. OF BALTIMORE CITY v. AMERICAN FOUNDRY & MACHINE CO.

(Circuit Court, D. Maryland. November 12, 1907. 156 F. R. p. 777.)

PATENTS—INFRINGEMENT-METAL PLANERS.

The Detrick patent, No. 472,804, for a metal planer of the open-side type, and constructed to plane two surfaces of an object at the same time, which describes a machine having a side post with a vertical slideway upon which is adjusted a horizontal arm also having a slideway, and carrying a tool saddle for the tool which planes the horizontal face of the object, while a depending arm constructed integrally with such beam at the end next the post has a slideway upon which is adjusted a tool for planing the vertical face at the same time, held infringed by the machine of the Robinson patent, No. 783,223, which as described in the patent has the vertical cutting tool mounted upon a slideway attached to the side of the post and entirely independent of the horizontal beam carrying the other tool, but in which, as actually constructed, such slideway, when in use, is attached to, and dependent on, the downwardly depending arm of such beam, without which it would be ineffective, and such construction making it substantially identical in all respects with the Detrick machine.

AMERICAN CAN CO. v. McGINNIS et al.

(Circuit Court, D. Maryland. October 14, 1907. 156 F. R. p. 784.)

1. PATENTS—INFRINGEMENT —COMBINATION OF OLD ELEMENTS.

Where a patent is not for a pioneer invention, but for a combination of old elements, the range of infringing equivalents is restricted to those which perform the same functions in the same way.

2. SAME—CAN-HEADING MACHINE.

The Wheaton patent, No. 477,584, for a can-heading machine, is for a combination of old elements, and each claim has as an essential element, either expressly or by necessary reference to the specification and drawings, a mold made in two parts, one for each end of the can, and each part having two jaws, one of which opens, to receive the can body and heads, by turning on an axis which is at right angles to the axial line of the jaws. As so contrued, it is not infringed by the machine of the McGinnis patent, No. 796,928.

BOSTON WOVEN HOSE & RUBBER CO. v. PENNSYLVANIA RUBBER CO.

(Circuit Court, D. Massachusetts. Nov. 14, 1907. 156 F. R. p. 787.)

PATENTS—INFRINGEMENT—WHEEL TIRES.

The Schrader patent, No. 466,577, for improvements in wheel tires, has for its essential feature an internal clamping device for securing a U-shaped tire to the rim of the wheel whether used as a cushion tire, or as inclosing an inflated tube making it pneumatic, and is not infringed by the modern form of "clincher tire," in which the shoe or U-shaped outer tire is held in place by the pressure caused by the inflation of the inner tube, although such method is supplemented by stay-bolts or lugs.

LEONARD v. CUTLER-HAMMER MFG. CO. et al.

(Circuit Court, S. D. New York. Nov. 1, 1907. 156 F. R. p. 791.)

PATENTS—INVENTION — CONTROLLERS FOR ELECTRIC MOTORS.

The three claims of the Cutler patent, No. 668,140, and claims 1, 6, and 11 of the Leonard patent, No. 673,274, both for circuit controllers for electric motors, are substantially identical, and such claims, as well as claims 7 and 10 of the Leonard patent, are too broad, and, in view of the prior art, are void for lack of invention.

HARDISON et al. v. BRINKMAN.

(Circuit Court of Appeals, Ninth Circuit. Nov. 4, 1907. 156 F. R. p. 962.)

1. PATENTS—INFRINGEMENT — CASING PERFORATOR FOR WELLS.

The Hardison patents, No. 650,318 and No. 686,691, for automatic casing perforators for deep wells, are neither of them for a pioneer invention, but both cover combinations of old elements only; the combinations being patentable improvements on the prior art and entitled to protection against infringement, but not such as to entitle the claims to a broad construction. As so construed, neither patent is infringed by the machine of the Brinkman patent, No. 726,665, which contains no friction device; that being an essential element in the combination of both the Hardison patents.

2. SAME — CONSTRUCTION OF CLAIMS—IMPROVEMENT PATENTS.

In a combination patent for an improvement in the arrangement or adaptation of old elements, the inventor is not entitled to a broad interpretation of the doctrine of mechanical equivalents, so as to cover a device not specifically included in his claims and specification.

3. SAME—LIMITATION BY SPECIFIC DESCRIPTION.

A patentee is bound by his claims, and cannot claim a broader invention than that which he has specifically described therein, even though he may have been entitled to make broader claims.

GENERAL CHEMICAL CO. v BLACKMORE.

(Circuit Court, S. D. New York. Nov. 20, 1907. 156 F. R. p. 968.)

1. PATENTS—INTERFERENCE SUITS—SCOPE OF DECISION

In a suit under Rev. St. § 4918 [U. S. Comp. St. 1901, p. 3394], for relief against an alleged interfering patent, upon the establishment of an interference, it is the duty of the court to investigate and decide any question considering the validity of either of the patents raised by the pleadings in the case.

2. SAME—INTERFERENCE—VALIDITY OF REISSUE.

The Blackmore reissue patent, No. 11,995, (original No. 868,022), for a process of making sulfuric anhydrid, claims 6 to 11, inclusive, which were added to those of the original patent, cover the prior invention disclosed by the Knietsch patent, No. 652,119, and are void for interference as against such patent. Such reissue is also wholly void as not authorized by Rev. St. § 4916 [U. S. Comp. St. 1901, p. 3393], because the original patent was not invalid for defective or insufficient description or claims, and because the reissue, moreover, seeks to cover an entirely different alleged invention, namely, that of the Knietsch patent.

ELECTRIC CANDY MACHINE CO. v. MORRIS.

(Circuit Court, E. D. Missouri. Sept 22, 1905. 156 F. R. p. 972.)

1. PATENTS — CONSTRUCTION OF CLAIMS—PIONEER INVENTION.

A machine for making, on a commercial scale and more cheaply, an article previously made only by hand is a pioneer invention, and a patent therefor is entitled to a liberal construction.

2. SAME—RULES OF CONSTRUCTION.

Where the validity of a patent is in doubt because the claims are ambiguous, that construction is to be preferred which sustains the patent rather than that which would render it invalid.

3. SAME—USE OF REFERENCE LETTERS IN CLAIM.

The use of reference letters in a claim of a patent does not confine the claim to a part having all of the characteristics of that shown in the drawing, but it covers any equivalent of such part.

4. SAME—SUIT FOR INFRINGEMENT—DEFENSES.

It is not a defense to a suit for infringement of a patent that the alleged infringing device was made in accordance with a later patent.

5. SAME-ANTICIPATION-DEVICES IN DIFFERENT ARTS.

A patent is not anticipated by prior patents for devices used in different arts which were not intended to accomplish, and did not in fact accomplish, the objects and purposes of the invention of the patent in suit.

6. SAME—INFRINGEMENT—CANDY MACHINE.

The Morrison and Wharton patent No. 718,428 for a candy machine for making floss or spun candy was not anticipated, discloses invention, and is entitled to a liberal construction. Claim 1 also held infringed.

BAGLIN v. CUSENIER CO.

(Circuit Court, S. D. New York. January 7, 1905. 156 F. R. p. 1015.)

TRADE-MARKS & TRADE-NAMES-ABANDONMENT—RIGHTS OF PUBLIC.

The fact that the proprietor of a trade-mark has abandoned or lost the right to use it does not justify another in using it and the labels and packages of such proprietor on his own product, thereby representing it as the product of the original maker.

MICA INSULATOR CO. v. COMMERCIAL MICA CO.

(Circuit Court N. D. Illinois, E. D. Oct. 24, 1907. 157 F. R. p. 90.)

1. PATENTS—VALIDITY—EFFECT OF SUBSEQUENT ACTION OF PATENT OFFICE.

A patent duly issued cannot be made void by subsequent action of the Patent Office, but that power rests with the courts alone.

2. SAME — INFRINGEMENT — PROCESS FOR MAKING MICA SHEETS.

The Dyer patent, No. 483,646, for a process for making artificial mica sheets for electrical insulation, held not infringed, even if not invalidated, by the acquiescence of the patentee in the decision of the Patent Office denying a patent for the product on the ground of lack of patentable novelty.

WORCESTER BREWING CORP. v. RUETER & CO.

(Circuit Court of Appeals, First Circuit. November 14, 1907. 157 F. R. p. 217.)

1. TRADE-MARKS AND TRADE-NAMES-WORDS SUBJECT TO APPROPRIATION-"STERLING."

Although the word "sterling" is ordinarily descriptive of quality, and is not popularly used in connection with ale, one who adopted it to identify a particular manufacture of ale may be entitled to protection against its use by another, in such manner as to create confusion as to the origin or identity of the two products.

2. SAME— SUIT FOR INFRINGEMENT — RIGHT TO ACCOUNTING—LACHES.

Under the circumstances of this case, complainant, although it may be entitled to an injunction, is barred by its laches from the right to an accounting for profits.

MECHANICAL INVENTIONS AND DESIGNS.

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

John S. Irick, Chicago, Ill. Tray Holder for Trunks.—An object of this invention is to provide a simple device adapted to be readily applied to the tray of an ordinary trunk, and capable of automatically supporting the tray when the same is swung upward from a horizontal position, and adapted to be conveniently operated for releasing the tray to permit the same to be swung downward to a horizontal position within the body of the trunk.

D. Claude Akers, inventor; George J. Moriarty, assignee, Woodstock, Ill. Device for Holding Children in Bed.—An object of the present invention is to provide a device for preventing an infant or other helpless child from falling from, or crawling off, of a bed, and adapted at the same time to allow the child such freedom as is necessary for its comfort. Another object of the invention is to enable the device to be readily adjusted to suit the size of the child and the width of the bed.

Norbert Durand, Amery, Wisc., inventor; Joseph Carpenter, Range, Wisc., and E. P. Ekegren, Amery, Wisc., assignees. Breast Strap Slide.—This invention has for its object to provide a breast strap slide, capable of preventing too free a movement of the neck yoke connections on the breast strap, and thereby reducing to a minimum the jerking of the tongue or pole on the horses, and at the same time enabling a team to be guided and driven with greater ease than heretofore.

Norbert Durand, Amery, Wisc., inventor; Joseph Carpenter, Range, Wisc., and E. P. Ekegren, Amery, Wisc., assignees. Rail Joint.—An object of this invention is to provide a rail joint adapted to increase the strength of the rails, and capable of securely interlocking the ends of the same, whereby when the rails are spiked to the cross ties, they will be firmly coupled and effectually prevented from twisting or otherwise becoming displaced. Another object of the invention is to lessen the cost of rail joints, and at the same time effect a saving of labor in coupling the rails together, by providing a rail joint which will dispense with fish plates, bolts, bolt openings and nuts.

Jacob Wilcox, Amlin, Ohio. Spoke Tenon and Felly Clip.—An object of the invention is to provide a device applicable to both new and old wheels, and adapted to grip both a spoke and a felly, whereby the former will be securely fastened to the latter and effectually prevented from becoming loose. Another object of the invention is to provide a device, adapted to be advantageously employed in repairing wheels, obviating the necessity of substituting a new spoke for a spoke broken off at the tenon, and adapted also to be placed on the outer end of the spoke without removing the latter from the hub.

Jacob Wilcox, Amlin, Ohio. Fence Anchor.—The invention has for its object to provide a metallic fence anchor, of simple construction and easy to manipulate, and which will securely retain the lower edge of a fence in its normal position, thereby preventing any cattle from getting thereunder.

John Fisk, Houston, Tex. Riding Attachment for One Row Walking Seeder and Planter.—An object of the present invention is to provide an attachment for one row walking seeders and planters, adapted to convert the same into a riding seeder and planter, and capable of enabling the seeder and planter to which it is applied, to be adjusted bodily so as to operate at the desired depth, and also to raise the same above the ground when turning the machine at the end of the row, or when transferring the same from one field or place to another.

Ross D. Brown, inventor; Robert H. Riffee, assignee, Muncie, Ind. Glass Gathering Machine.—This invention has for its object to provide a glass gathering machine, adapted to move a rotating gathering instrument into a tank, and capable after the gathering instrument has been extended into the tank, of dropping it into the surface of the glass to permit it to gather its quota, and then of raising the instrument in a substantially vertical direction so as to cut off the threads of the glass. Another object of the invention is to provide means capable, after the gathering instrument has gathered its quota of glass, of withdrawing the same from the tank and of swinging it backward in a straight vertical plane to the rear of the machine over a mold, and of stopping the rotation of the gathering instrument at the limit of such backward movement to cause the glass to drop into the mold.

Ross D. Brown, inventor; Robert H. Riffee, assignee, Muncie, Ind. Glass Gathering Machine.—An object of the present invention is to provide means for projecting the gathering instrument different distances into the tank to arrange the machine to suit the temperature of the glass, and to enable the instrument to gather glass of the desired temperature. Another object of the invention is to provide automatically operable shears adapted to sever the glass from the gathering instrument without imparting a lateral or sidewise instrument to the severed portion of the glass, whereby the latter is caused to drop into a mold centrally of the same, instead of being thrown to one side of the mold. It is also the object of the invention to impart a rotary movement to the gathering instrument prior to swinging the same forward from the mold to the tank, so as to wind up the glass left hanging from the end of the gathering instrument by the cutting operation.

Delmar D. Pinkham, Longview, Tex. Two patents.—These patents relate to window and door screens in which metal frames are employed. One of the objects of the first patent is to provide a frame structure that can be shipped and sold in a knock-down condition, and readily assembled by the purchaser or user. Another object of the invention is to provide a frame which will constitute an effective clamp for the wire netting without the danger of cutting the same. A further object is to provide a guiding means for the frame, which is adjustable in order that it may be accommodated to any inaccuracies in the window frame.

The second patent has for its object to provide a knockdown screen, which can be readily assembled by the user, is strong, rigid and durable, and will permit the detachment and replacement of the netting, so that new material may be more readily substituted for that which has become worn out or broken.

Samuel H. Miller, Oklahoma City, Okla. Wrench.—An object of the invention is to provide a sliding jaw wrench, equipped with means for enabling it to be operated with great ease and quickness both to lock and release the sliding jaw.

William D. Goff, Joplin, Missouri. Power Transmitting Means.—This invention relates to means for converting rotary into reciprocatory motion for operating a plurality of reciprocatory members, as for instance, pump plungers, the said members being so arranged that they practically balance each other, and thereby eliminate to a great extent the shock due to the change of direction of movement. Another object is to provide mechanism wherein either reciprocatory members can be disconnected from the driving means, and to provide means that will act as a counterbalance in place of the disconnected member.

Charles A. Peak, inventor; (deceased) L. Amiet, assignee, Henderson, Ky. Hydrant.—The objects of the invention are to provide a hydrant in which the valve is located below the frostline, and also a novel mechanism which will permit the free escape of water in the delivery pipe when the valve is closed, and will close the waste passage when the valve is opened.

Frank Helm & Charles J. Helm, Traverse, City, Mich. Post and Tile Mold.—An object of the invention is to provide a post and tile mold, which will enable a concrete fence post to be constructed in the ground and at the place where it is to be used, either with or without an anchoring flange at its lower end. Another object of the invention is to provide a mold, equipped with inner and outer shells having slidable sections, adapted when drawn upward to automatically contract the inner shell and to expand the outer shell for facilitating the removal of the mold from the article molded.

Frank Helm, Traverse, City, Mich. Machine for Making Pressed Bricks.—An object of the invention is to provide a brick making machine capable of molding and of pressing clay, cement and analagous material into the desired form, and adapted to produce a number of bricks at each operation. Another object of the invention is to provide a brick making machine to which the cement, clay, or other material may be conveniently delivered, and which, after the bricks have been molded and pressed, will enable the same to be readily removed.

Frank Helm, inventor; Charles J. Helm and Edward Roesser, assignees, Traverse City, Mich. Woodworkers Bench Clamp.—An object of the present invention is to provide for carpenters, cabinet makers and the like a bench clamp, designed to dispense with the use of a tail piece or screw of a bench, and adapted to hold material of any size, shape and thickness. Another object of the invention is to provide a bench clamp, adapted to enable all the work to be performed at the head of a bench, where the tools are usually placed, thereby effecting a material saving of time in handling and operating on the material.

John H. Kinley, Upper Sandusky, Ohio. Flue Stop.—An object of the invention is to provide a flue stop designed for closing stove pipe holes, flues, and the like, and adapted to present a smooth exterior surface when applied to a stove pipe hole, so that it may be covered with wall paper without causing that portion of the wall to present a different appearance from the other portions of the same. Another object of the invention is to prevent the wall paper from being either soiled or burned, and to provide a flue stop, which will not allow either smoke or soot to enter a room, and which when removed from a stove pipe hole, will effectually prevent soot and ashes from falling upon the floor.

Michael Lally, North Lawrence, Ohio. Ball Bearing Writing Ring.—An object of the invention is to provide a writing ring, designed for use on the finger of a penman to render the hand firm and steady, lessen the labor of writing and prevent the cramping of the fingers. Another object is to produce a ring equipped with means for enabling the hand to move freely over the paper without soiling the same, and capable of ready adjustment to fit any size finger.

Peter G. Minier, Ridgway, Pa. Snow Plow.—An object of the invention is to provide a snow plow having side wings, adapted to be readily moved outward for increasing the width of the cut made by the plow, and capable of being quickly moved inwardly within the frame of the plow when the same is passing a station, crossing, or other place, which might offer an obstruction to the passage of the snow plow when the wings are in their extended position.

Paalgo P. Gibbs, Gordon, Texas. Pneumatic Knee Pad.—An object of the invention is to produce a pneumatic knee pad, adapted to be readily adjusted to the leg of the wearer, and capable of affording a soft cushion to the knee, and of enabling the leg of the wearer to bend in kneeling without straining or tearing the trousers.

Geo. Gamston, and Harry Coward, Philadelphia, Pa. Carpet Cutter.—An object of the invention is to provide a carpet cutter, designed for cutting carpets to fit the projecting portions and recesses of rooms, and capable of enabling a carpet to be rapidly and accurately cut at any angle, and adapted to securely hold the carpet and effectually prevent the same from slipping during the cutting operation. Another object of the invention is to provide a carpet cutter, in which the cutting mechanism may be swung upward and supported out of the way while placing a width of carpet in position for cutting.

John C. Wood. Portsmouth, Ohio. Trace Fastener.—This invention relates to means for securing traces to whiffletrees, said means being readily operable to permit the trace being detached from the whiffletree, and furthermore being so constructed that it will not become clogged with dirt, and will not become inoperative by water or snow freezing therein.

John C. Wood, inventor; Edwin L. Allen, assignee, Portsmouth. Ohio. Detonating Toy.—An object of the invention is to provide a toy cane equipped with sections or members, movable toward and from each other for exploding successfully a strip or ribbon of paper or other percussion caps, and capable of automatically feeding the caps between the sections, and adapted to prevent any back flash from entering the magazine and igniting the strip or ribbon.

Hillyard A. Starr, Chattanooga, Tenn. Two patents.—The first patent relates to a damper mechanism for stoves which can be readily placed in position in the stove after such stove has been assembled, and which is so simple that an unskilled person can remove a broken damper and replace it with a new one without dismantling the stove.

The second patent relates to stove lids and center-pieces which are not liable to become warped from the heat of the fire, as they are so constructed that air is employed as a cooling medium. Furthermore, the invention comprises a lifter-receiving socket which will properly receive an ordinary lifter, and which is not so liable to wear or break out as the ordinary cast socket.

NEW PATENTS FOR SALE.

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FOR SALE—Patent No. 797,887, Pail Cover. For cash or cash and royalty. Address, C. F. Dihble, Rochester, Minn. apr

FOR SALE or royalty—Patent No. 902,128. Land marker for corn planters. Self-lift. Address, Elmer Youtz, Casner, Ill. apr

FOR SALE—An entirely new idea of a swing for amusement. Address, Fred Wieferich, No. 336 High School Ave., Council Bluffs, Iowa. apr

FOR SALE—Patent No. 899,878. Reaper. Under shop or royalty plan. Offers to be considered before March 1, 1909. Address, T. E. Lind, Moose Jaw, Sask., Canada. apr

FOR SALE—Patent No. 896,619, dated August 18, 1908. A feed bag that does away with the waste of grain. Will sell reasonably. Address, L. M. Burke, Lay, Colorado. apr

FOR SALE—Patent No. 885,216. A mail pouch deliverer and receiver. Easy to manufacture. Made of piping. Will sell cheap if at once. Need the money on other patents. Address, John Anderson, Box 265, Waurika, Okla. apr

FOR SALE—U. S. Patent No. 902,831, dated Nov. 3, 1908. Self-lubricating bushings for pulleys. Will sell outright. Write C. A. Petersen, P. O. Box 41, Laconia, N. H. apr

FOR SALE—Patent No. 901,396, dated October 20, 1908. Car truck for street or trunk roads; will sell all or part; or will consider proposition to manufacture and market. Address, Richard Smith, Lock Box, 313, South Broadway Station, Denver, Colorado. apr

FOR SALE or on royalty—U. S. Patent No. 895,940. Envelop. Cannot be opened without detection. Contains two separate pockets. Cannot be detected from an ordinary envelope when sealed. Address, William P. Ballard, Wallowa, Oregon. apr

FOR SALE—Patent No. 901,407. Grave Attachment. Has mirrors arranged in a novel manner so that the face of the dead may be viewed from outside the grave. Address, George H. Willems, Roanoke, Ill. apr

FOR SALE—Patent No. 901,325. $5,000 will secure an active or silent one-half interest in an up-to-date toy that will return investment on first year's sales. Will sell outright for $8,000. Act quick. Address, William H. Davis, Federalsburg, Md. apr

FOR SALE—Patent No. 899,675, dated Sept. 29, 1908. Attachment for ironing boards; an article that is wanted by every house wife; will sell outright at reasonable price; have not means to manufacture. Address, Joseph Michael, 446 North Railroad St., Pottsville, Pa. apr

FOR SALE—U. S. Patent on a non-refillable bottle. No. 898,575, patented Sept. 15, 1908. For sale reasonable, or let on royalty. Send 10 cents to the publisher of the "Inventive Age," (giving this patent number) for a copy of the patent giving full description of same, or write to me for particulars in the matter. Reuben R. Graves. R. F. D. No. 3, Box 35, Salem, Oregon. apr

FOR SALE—U. S. Patent No. 904,012. Detachable tool handles. Address, Henry F. Pocan, Marinette, Wisc. apr

FOR SALE—Patent No. 905,059. A simple foldable lace curtain stretching and drying frame; works automatically; is neatly folded; can be made quite cheap. Will sell reasonably for cash or on royalty. Address, Peter J. DeVries, Hull, Iowa. apr

FOR SALE—Automatic Show Case. Can be made in several sizes. Adapted for fountain pens and jewelry especially. Convenient and simple. Will sell cheap if taken at once. Address, L. Peters, Marinette, Wisc. apr

FOR SALE—Patent No. 904,706, dated Nov. 24, 1908. Mink and muskrat trap. Best trap on market. Will catch as many as seven rats at one time. No lost rats or broken legs. Make me an offer. Write. B. A. Mastensou, Route 2, Ortonville, Minn. apr

FOR SALE or royalty—U. S. and Canadian patents No. 869,134. Collapsible Crates. Made of wood and metal. All parts are permanently connected; has locking ears. Can be quickly set up, or folded. This is the invention you want to revolutionize the crate business. Can be used for all kinds of fruits. I will sell outright or state rights. Canadian patent at your own price. Make me an offer. Write, Perry E. Boyd, Canton, Ga. apr

FOR SALE—U. S. Patent No. 882,396, dated March 17, 1908. Lantern Holder. Address, C. W. Leaning, Lock Box 3, Yankton, S. Dakota. mar

FOR SALE — Patent No. 891,052, dated June 16, 1908. Non-Refillable Bottle. For sale outright or royalty basis. Very simple and effective. For full particulars address, H. F. Erfman, Miamisburg, Ohio. feb

FOR SALE—Patent No. 712,173, dated October 28, 1902. A Non-Refillable Bottle. Address, Matthew M. Beam, Oldforge, Pa. feb

FOR SALE—Patent No. 893,992, dated July 21, 1908. An all around level; pitch, plumb, or any inclination. Cheap for cash. Address, Fuessel Bros., Box 85, Hicksville, N. Y. feb

FOR SALE—Patent Nos. 886,283, 898,807, and 891,647. This will build a complete gasolene engine. Will sell outright or in any way the purchaser desires. Address, Wm. L. Wayrynen, L. Box W., Norden, S. Dak. feb

FOR SALE—Patent No. 899,367, dated Sept. 22, 1908. Foot Arches. Can adjust to any foot with comfort to wearer. Will sell outright, state rights or royalty, or take partner with capital to manufacture. Address, F. J. Winchell, Box 39, Lynn, Mass. feb

FOR SALE — Patent No. 892,794. Improved Guard Attachment for Sewing Machines. Price $2500. Only guard which entirely shields fabric from driving mechanism of machine. Adjusted to any high-arm make. Cost of manufacturing 10 cents each. An easy seller at $2.00. Address, Miss E. Bailey, Fordoche, La. feb

FOR SALE—Patent No. 896,073, dated August 18, 1908. Ratchet Wrench. Handy device for mechanics and farmers. Will sell outright. Correspondence solicited. Address, Theodore Atzenweiler, R. F. D. No. 1. Huron, Kansas. feb

FOR SALE—Patent No. 900,843, dated October 6, 1908. Horse detacher for runaway horses. Holdbacks and traces released at same time in two seconds. Address, J. R. Claxton, Box 60, Doon, Iowa. mar

FOR SALE—Patent No. 896,578. Nut locking device for rail joints. Will sell outright or to each individual railroad, or will sell on a royalty; also to manufacturers. Address, Richard Richards, Alhia, Iowa. mar

FOR SALE—Patent No. 898,637. Bridle Bit. The bit that is best by test. Controls most vicious horses. Perfectly humane. A bargain if sold at once. Address, D. S. Gallatin, Dalton, Ohio. mar

FOR SALE—Patent No. 899,923. A safety trace holder. Very simple and easily applied by any body. Will sell patent outright or manufacture on royalty. Address, John Unger, P. O. Box 263, Louisville, Colo. mar

FOR SALE—Patent No. 898,287, dated Sept. 8, 1908. Steel Railway Tie. By combination a new device for the railway and railroad man and manufacturers who are ready to consider a good thing for the future. Address, A. O. Thunborg, Webster, Burnette Co., Wisc. mar

FOR SALE—U. S. Patent No. 898,820, dated September 15, 1908. Stone Dressing Machine. Will cut two sides of stone at one operation without turning stone over. No chips in the way. Will not chip or stun stone. For particulars address, J. C. Armstrong, Newkirk, Okla. mar

FOR SALE—Power Wheel. No dam. Works regardless of frost or flood. For mills, dynamos, or irrigation. No. 107,660 Canadian, No. 896,867 U. S. A., patented August 25, 1908. Address, W. P. Spooner, Carievale, Sask., Canada. mar

FOR SALE—Patent No. 901,917, outright. A very valuable and useful crib made of wood. Can be manufactured very cheap. Address, Theodore Kreisel, Warrenton, Va. mar

FOR SALE—Patented 903,719, dated Nov. 10, 1908. Danger Signal for Automobiles. Applied to the rear of automobiles to prevent rear end collisions. Has utility in other directions. Address, Oscar Herrmann, No. 65 Central Park West, New York City. mar

FOR SALE—U. S. Patent No. 897,894. Out-Trapping Fly Escape Screen, which will trap all the flies in a room, and will do away with all the fly poison and sticky paper. Can be manufactured for 10 or 15 cents apiece. Address, Henry A. Hanson, Grano, North Dakota. feb

FOR SALE—Patent No. 898,328, dated Sept. 8, 1908. Mechanical Movement. May be used as a gig drill; a coal auger; mining drill; and for automobile shaft. Patent No. 898,329, dated September 8, 1908. Automatic Hook. Quickly releases the load without letting out the slack; will be found helpful both in shop, and in releasing life boat from the falls in time of storm. Cash or royalty. Address, C. J. Coulter, Longmont, Colorado. feb

FOR SALE—Patent No. 831,427. Device for suspending mosquito netting or canopies. For use either in private families or hospitals. Possesses wonderful cooling capacity. Prevents mosquitoes from getting near the sleeper or patient. Quick buyer will procure a bargain. For terms and other information address, J. B. R. Noble, No. 72 Summers Avenue, Washington, Pa. sep. 09

FOR SALE—U. S Patent No. 861,872, dated July 30, 1907. Ventilator. Can be used on board of ships as well as on private or public buildings. Address, Roderick MacDonald, Fletcher St., Glace Bay, N. S., Canada. feb

FOR SALE or on Royalty—U. S. Patent No. 887,742, issued May 12, 1908. Set Saw Gauge, also Canadian patent on same. Address, J. S. Scott, P. O. Box 372, Fredericton, N. B. Canada. feb

FOR SALE—Package Tie. U. S. Patent No. 896,472, and Canadian Patent No. 113,775; English patent pending. For sample and information write. Dr. E. L. Sharpe, Pleasanton, Texas. feb

FOR SALE—Patent No. 896,534. Improved Nut Lock. The best nut lock of the present age, for railroad or automobile work. Inventor, A. L. Hart, Box 866, Barnesville, Ohio. feb

FOR SALE or on Royalty—U. S. Patent No. 896,095; a bottle with a detachable strip of glass attached to lower end to form seal over mouth of bottle. Strip to contain all blown-in names of letters or marks, by which bottle cannot be used for fraudulent purposes. Address, H. E. Erwin, Hazel, Kentucky. feb

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WANTED—An individual or corporation to manufacture on a royalty my patent No. 904,127, on a manure spreader. Built to fit an ordinary farm truck, with a capacity of from 50 to 100 bushels, and a spread from four to eight feet. If interested write me, Loren G. Herrick, Luverne, Minn. apr

WANTED—To buy or lease some good simple and practical invention to add to our line of specialties. Send sample or description, and state terms. Hagstrom Bros. Mfg. Co., Lindsborg, Kansas. mar

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A Court of Patent Appeals.

The advisability of establishing another supreme court, to have jurisdiction in patent cases exclusively, has been emphasized more than once in these columns. A bill to provide for such a court is now pending before Congress, and its passage is being urged by the patent bar associations of prominent cities all over the country. Patent law is entirely different from general law: it is a science of its own, involving the consideration of problems in engineering, mechanics, chemistry, etc. A good patent judge must have special training and aptitude, and at the same time be well equipped in the field of general practice. Under the present system of appeal to court decisions, there is a constant and most confusing conflict of authority in patent causes. These are now heard first by the United States circuit courts of the nine circuits, and then on error or appeal by the circuit courts of appeals of the various circuits. The judgments of the latter are final, except on appeal to the Supreme Court by special writ of certiorari. In practical operation, it will be seen, we thus have nine supreme courts to deal with patents, as each court of appeals is supreme in its own circuit. This results in collisions of opinion which present an anomalous legal situation. It is essential to justice that a patent, being a grant to be enjoyed throughout the entire country, should have the same force and interpretation in all of the separate states. It was thought that differences in the decisions of the courts of appeals could be regulated by comity, as is done in the circuit courts; but little relief has been afforded in this way. A judgment rendered in favor of a patentee in Pennsylvania, say, is not binding in Massachusetts, and infringers in Colorado have the right to make independent defenses in their circuits. When a patent is declared invalid in one circuit, people in the other circuits cannot be sure that they have any right to manufacture or use the mooted article, for the plaintiff may go into every other circuit and bring suits against alleged infringers. It is to the interest of the public, as much as of the inventor, to have this faulty system amended, and the question of scope and validity of a patent settled by a court whose decision will be absolute, not only in two or three states, but throughout the entire land.

A court to have special jurisdiction over patent cases would seem to be justified by the fact, to quote a legal authority on the subject, that the subject of patents goes not to any particular trade, nor to any particular class, but it goes to the whole nation, and every person in it, and particularly to every man engaged in business of any kind. As embodied in the measure now pending before Congress, the court is to have five justices. The chief justice will be appointed by the President, with the consent of the Senate, and the associate judges are to be appointed by the chief justice of the United States Supreme Court, from the judges of the circuit and district courts. Two of the judges are to retain office for three years, and two for six years. The chief justice is to receive a salary of $12,000 per annum, and the associates $11,500, this amount including the salary already paid them as circuit or district judges, as the case may be.

The court is to have jurisdiction to hear and determine appeals and writs of error from final decrees in the circuit courts of the country, and in other courts having power to hear such cases in the first instance, except in cases originating in the court of claims, over which the new court is to have no authority. A tribunal as described, composed of judges who had been selected for their special fitness and ability to deal with patent cases, would give us the best patent court that ever sat in the world. The confusion and loss that arise from the present system, and the fact that the patent business is second in importance to none other in the United States, seem to us to offer unanswerable arguments in favor of some measure of relief.

Aid to Workmen.

In view of the growing sentiment in behalf of labor insurance, employers' liability and similar measures to alleviate the condition of the workingman, it is interesting to notice the progress of such movements in Germany. The extent of the efforts to aid the laboring classes in that country, through voluntary contributions by private firms and individuals, will astonish many readers. The law demands a certain amount to be paid by employers for insurance, sick funds, etc., for the benefit of those who labor in their interests, and this, in twenty years, totalled the imposing figure of $714,000,000. Nor was this all. Many firms went beyond the legal requirements and provided all kinds of philanthropic organizations by which the employes should profit. Nearly $28,000,000 was given within a single year in different classes of donations, and more than two-thirds of this sum represented voluntary contributions on the part of individuals and private firms. Of this total, pensions represented over four millions; premiums and share in profits, two and a half millions; general improvement of workmen, not specified, over nine million. For co-operative purposes in various lines, half a million was expended; for homes for the aged, eight hundred thousand; for aid to sick, wounded and convalescent, over a million; for dwellings and lodgings, over two and one-fourth millions. Half a million is credited to education, and six hundred thousand to social and club purposes.

In this connection, some of the official figures of government insurance are worth noting. The German Empire has nearly a million pensioners on its list, including the classes of invalids, the aged, and those incapacitated for work. Between forty and fifty million dollars were paid to these pensioners. The above quoted figures in regard to private enterprise do not include minor efforts, which, it is stated, it would be impossible to detail on account of their number and diversity. In the organization of such enterprises, and in the general activity of corporate consciences, Uncle Sam has something to learn from the Fatherland.

Paper from Cotton Stalks.

Another instance of the utilization of waste is offered in the recently invented process of making paper from cotton stalks. For years farmers in the South have had to cope with the problem of disposing of the stalks left on the field after the cotton crop has been picked. They have frequently been burnt, and in all cases have been regarded as mere incumbrances of the soil. Now this neglected product has been found to have a decided value, especially in view of the growing scarcity of paper materials. Forestry experts say that the supply of wood fiber available for paper manufacture will last but a few years longer, and the globe has been ransacked for a substitute that would satisfy the enormous and constantly growing demand. Those who have seen the operation of the new system declare that this substitute has now been found. The fiber in the stalk and limb of the cotton plant is decidedly tougher than the fiber of spruce wood; in fact, it is asserted that it is practically as strong as flax fiber, which would make it possible to obtain from cotton stalks a paper superior to the ordinary wood pulp product, and almost as durable as the finest linen paper. For book work and all classes demanding a high-grade paper, this new material will be invaluable.

As to the expense of the process, cotton stalks could be had at much less cost than wood. Cotton growers pay every year to have the stalks removed from the fields, and the raw material could thus be obtained at a very low rate. In regions where the boll weevil flourishes and the crops have been destroyed, the new method would help to eradicate the insect, as it uses the entire plant, the leaves and unopened bolls passing through the mill as well as the stalks, when desired. The operation itself is also less costly than that required to handle wood. It is estimated that cotton stalk paper costs fourteen dollars a ton, straw paper eighteen and a fraction, while ground wood costs upwards of twenty dollars a ton, and bleached sulfite at least fifty dollars for the domestic, and more for foreign stock. According to these figures, the expense of the finished cotton stalk paper is considerably less than the price of the lowest grade of ground wood pulp. Any ordinary paper machine can be utilized for manufacturing this new paper. It is believed that a new industry will soon be started which will add thousands of dollars to the income from the cotton plant.

The Cullinan Diamond.

The world has followed with interest the career of the Cullinan diamond from the time of the discovery of the mammoth stone up to the period of its presentation to the King of England. It is now being polished in Amsterdam, and our consul at that city gives an account of the progress of the work. The delicacy of the task, he says, cannot be realized. It was necessary in the first instance to cleave the stone in three pieces in order to remove two bad flaws. This cleaving is done by first making an incision into the stone with a diamond-cutting saw at the point where it is to be cleaved, and following the grain (as all diamonds have a grain, after the manner of wood) to a depth of one half to three-quarters of an inch. Before this cleaving operation was undertaken, crystal models were made and cleaved, in order to ascertain as far as could be known, just what would happen when the same process was applied to the real stone.

After the incision was made, the cleaver inserted into the slit a specially constructed knife blade made of the finest steel, and then with a thick steel rod struck it a hard blow and cut the stone in twain exactly at the point where it was proposed it should be cut. It was an exceedingly well-executed piece of work. It must not be overlooked that the cleaving of a diamond is not always done along the line intended. It not infrequently happens that in cleaving a stone it flies into a great number of pieces.

The stone having been successfully split, the final operation is the polishing, and this process is now being carried on.

To give an idea of the hardness of diamonds, it may be interesting to state that the disk on which this diamond is being polished, which is made of cast iron and steel, revolves at the rate of 2400 revolutions per minute. The diamond is pressed down on this disk, which is liberally supplied with a mixture of diamond dust and oil, by weights of 15 or 25 pounds, and the disk turns constantly 14 hours a day, including Sundays, for 10 or 11 months before the operation will be completed.

It has not yet been positively decided in what shape the stone will be finished, but the general impression is that it will be pear-shaped. It will be, when complete, many times larger than

the Excelsior, which was, up to the discovery of the Cullinan, the largest diamond in the world. The Cullinan weighed in its rough state over 3,000 carats, and was valued at about $1,000-000. The part of the stone which is on the mill will weigh, when finished, between 500 and 600 carats. The actual commercial value of the completed stone will be about $2,500,000, but its unique character will possibly make it priceless.

Photographs on Tombstones.

A large glass company in the United States is now turning out headstones for graves made of glass, with photographs of the deceased blown in the glass. Similar photographs are likewise being placed on stone monuments. These are made by an underglazed photo-ceramic process on copper, which is dipped in vitrified enamel and subjected to a high degree of heat. They are then glazed and are guaranteed to be impervious to the weather. The large photographs are screwed onto the tombs, and the smaller ones cemented into a groove in the stone.

Weighing Touch.

A wonderful instrument is that which has recently been invented, for the purpose of measuring the sense of touch. The device consists of a series of little disks, suspended by fine, delicate thread from wooden handles, the last being stuck into holes around a block. The lightest disk is taken out and brought into contact with the skin of the subject, the latter having closed his eyes. If nothing is felt, a heavier disk is employed, and so on till the pressure becomes noticable. Through the medium of these disks, it has been found that the sense of touch in the average person is acute on the forehead and temple. A touch of a disk weighing three hundredths of a grain was observable on the temple; one weighing five hundredths on the nose or chin, and one weighing nine hundredths on the inside of the fingers.

The Tetrahedral Areodrome.

And now a new form of aerodrome is to join the navies of the air. Dr. Alexander Graham Bell, who has been experimenting with this device for some years, has finally completed the frame of a tetrahedral aerodrome, with 5,000 cells. Trials with kites built after this fashion, with a number of pyramidal chambers, have shown that they possess great lifting power and can be managed and controlled with facility; and Dr. Bell believes that the true solution of the problem of flying is to be found along these lines. His new machine is to be launched from a lake. The aerodrome is to be placed on a platform held between two motor boats, which will start at the same time. When a speed of 18 knots an hour has been attained, the machine will be released. Another plan is to have the airship propelled by its own motors over the surface of the water, to get sufficient speed to expand its wings. The machine will be attached to light canoes, which will be carried by the vessel as it leaves the water on its flight. The results of the trials will be awaited with interest.

Cement Boats.

The foresight of Italian engineers in experimenting with concrete as a shipbuilding material, has won for their native country the title of "The Land of Concrete Boats." It is not simply a novelty, as some believe, but a clearly defined industry, which is rapidly growing and will find a still larger field before many years have passed.

The method of construction, says an article in *Popular Mechanics*, is simple and the boats are quickly made. The cost is less than half that of wooden or steel boats, and the expense of maintenance only one-fourth. The boats will stand very rough usage, are practically indestructible so far as the element of time is concerned, and, of course, are fireproof. It is also claimed that the smooth surface of the cement finish offers less resistance to the water than wood, and that the bottoms cannot foul easily or collect seaweed. In case of damage to any portion of the boat, repairs can be quickly and cheaply made with cement and concrete.

Artificial Silk for Gas Mantles.

The well known Welsbach mantles for gas light have been made, as is generally understood, by saturating woolen or ramie fiber with a solution of rare earth, which produced the increased light. Experiments to substitute silk, hemp or jute proved unsuccessful, bnt it seems that an artificial fiber has now been found which in all respects is equal to wool or ramie. The *Moniteur Scientifique* says that this is an artifical silk, made by dissolving cellulose in an ammoniacal copper solution. It is then saturated with nitrate of thorium, and through the action of ammonia, hydro-oxide is formed upon the fiber, which after incineration leaves a perfect, solid skeleton of hard little crystals.

One of the advantages of this new mantle is that it is not hydroscopic. It is also very durable. Experiments have shown that two or three thousand shocks do not injure it, while the best mantles prepared by the old methods did not survive more than 100 shocks.

Sugar Cane Paper.

So many vegetable fibers have been found suited to the manufacture of paper, that it is not surprising to learn that a planter in Trinidad has invented a device to prepare it from sugar cane bagasse. For a long time this substance has been subjected to experiments in the hope of making cellulose for paper manufacture, but up to this time without success. The new process grinds the bagasse three times, and presses it. It is then conveyed to a mill and boiled for several hours, passed through rotating millstones, put into the usual machines for making pulp, and afterwards cut up under hydraulic pressure. It is claimed that 84 per cent of the bagasse is transformed into paper pulp, and if this is true, it would have a remarkable effect upon the sugar industry, which has suffered so severely from the competition of beet sugar. It would be possible with this new process to grow cane primarily for paper making, with the sugar as a by-product. The cost of producing paper by this process is said be very low, bagasse having been used as fuel at a value of only $1.80 per ton.

Railway Wind Gauge.

In order to protect trains from risk in crossing an exposed viaduct, a wind gauge is in use near Ulverston, England. The apparatus is fixed at one end of the viaduct, according to *Science*, and has an actuating part consisting of two boards, kept in a vertical position by springs, the movements of which are shown on a chart by means of the customary pen and clockwork appliances. A pen is operated by either board according to the direction of the wind, and for greater exactitude of time, the chart paper, over 65 feet long, is perforated, the holes in the paper corresponding with studs in the clockwork wheel. When the wind pressure reaches 32 pounds to the square foot, the springboards referred to are adjusted to make an electrical contact, ringing bells in the signal cabins on either side of the viaduct. When this occurs, all trains are detained until the force of the wind moderates. At times a velocity calculated as equivalent to 65 miles an hour is recorded.

Steerable Balloons.

With the exception of the recent successful achievements of Wright and of Farnum, experiments in aeroplanes and other types of flying machines have disappointed aeronauts in Europe. On the other hand, a definite and advanced stage of progress has been reached at Paris, says our Consul General there, in the construction of air ships or dirigible balloons, driven by a rotary propellor and steered by a rudder similar in form and action to that of a ship at sea. Two large balloons have recently been seen flying over Paris, at altitudes varying from 1000 to 5000 feet, maneuvering easily up or down the wind, turning to right or left, and returning after their flight to the original point of departure. These two air ships, which embody the most perfect standard of efficiency thus far attained in French dirigible balloons, are pointed at the bow, with flat or cylindrical flanges at the stern which serve as a keel or feather of an arrow to steady the hull when working on or into the wind. The car and machinery are carried by the long skeleton frame, which is hung underneath the hull, with the two-headed propeller in front, the motor amidship, and the rudder at the rear.

So safe and manageable have these airships proven that many distinguished persons, including two cabinet ministers, have been on board during some of their recent flights.

Suction Dredges.

The old time dipper dredges which are familiar objects in the harbors and channels of the country, are being replaced by a new type which operates by suction. These boats were constructed by the government in the nature of an experiment, and have been used on the Atlantic Coast but a short time. The first one to be used on the Great Lakes is now in operation on Lake Michigan. These sandsuckers, as they are popularly known, excited considerable curiosity in marine circles when they were first employed, as it was believed that they could not operate as effectively as the dipper apparatus; but after thorough trial, it was found that they are not only more satisfactory in clearing accumulated sand from harbors, etc., but that they work at one-fifth the expense of the old style.

In appearance, the new boats resemble steamers rather than dredges; and in fact they are able to move up and down the coast under their own power. Two great pipes drag along the bottom on each side of the vessel, and powerful pumps draw the sand and water into the hold of the ship, where the water runs off and the sand is carried out into the deep water and dumped by means of trap doors in the bottom of the steamer. This dispenses with the use of tugs and scows, and enables much more work to be done in a day than with the old dipper dredges. The power of the new device is shown by the fact that while dredging in a lake harbor, the sandsuckers drew a rock weighing 100 pounds into one of the pipes. The cost of dredging with this new method is about 8 cents per square yard.

Industrial Alcohol.

Since the passage of the "Free Alcohol Act," much has been written about the possibilities of this new fuel. Distilleries are being established in certain sections of the country, and in the course of a few years the nature of this source of power will probably be as well appreciated in the United States as it is on the other side of the Atlantic. The fact that a new market is opened for the farmer and manufacturer through the employment of denatured alcohol, has caused a wide demand for information about this substitute for oil and gasoline; and one of the most comprehensive and satisfactory of all handbooks on the subject has been written by F. B. Wright, under the title "Distillation and Denaturing of Alcohol." To most people, alcohol means simply liquor: the author explains that it is not a natural product, but is formed by the decomposition of sugar or glucose through fermentation. This leaves alcohol mixed with water, and these in turn are separated by distillation. He describes the forms and sources of alcohol, and various types of distilling apparatus, from the simple apparatus used until the last decade, to the more complicated processes which have been lately devised. In language intelligible to the laity, he tells how to produce alcohol from potatoes, from beets, from molasses and sugar cane, and from cereals of various sorts, such as grain, corn, wheat and rice. Illustrations are given of the most modern and approved appliances used in this country, and in Europe, where the manufacture of industrial alcohol has been highly perfected. Another valuable feature of the volume is the collection of U. S. denaturing formulas covering the special denaturants required by the arts and by the Government regulations, and the whole is so prepared as to enable every reader to understand the theory and general practice of preparing free alcohol.

The book is published by Spon & Chamberlain, New York City.

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Clip and spring construction..M. L. Senderling
Closet-tank.....L. Lindenberg
Clothes-pin.....E. D. Tichenor
Clutch.....C. E. Van Auken
Clutch, Friction-.....C. E. Van Auken
Cocks with exchangeable lock, Locking device for.....M. Ebert
Coffee-urn.....H. D. Kelly
Coke-drawing apparatus.....C. M. Clarke
Collar-supporter.....N. Illoway
Colored light-rays, Producing.....P. C. Hewitt
Concrete columns or pillars, Clamp for mold-forms for.....W. H. Healy
Concrete-construction form.....W. L. Axium
Concrete-mixer.....E. B. Ravencroft
Conduit wire-drawing, Compressed-air engine for.....H. C. Dickinson
Convertible chair.....W. W. Lepard
Conveyer or cableway rope-carrier.....W. A. Wood
Conveyer, Pneumatic.....J. and W. L. Hervey
Cooker stirring mechanism.....G. H. Hoffman
Cooking-pan.....D. and K. Lewis
Corn-popper.....S. A. Jones
Corn tipper, Seed-.....W. T. Caldwell
Corset.....M. Heath
Corset-cover and undervest, Combined.....M. K. Bennett
Cotton-cultivating implement.....A. L. and J. C. Kirkpatrick
Cotton-picking machine...J. and W. L. Hervey
Cotton-seed hulls, Treating.....P. G. Grant
Couch and bed.....F. J. and L. A. Crouch
Couch, Box-.....A. H. Greenlund
Crab or windlass.....R. E. Noble et al
Crane mechanism.....R. L. Frink
Crate.....S. D. Heller
Cream from milk, Separating....R. W. Padden
Cream-separator, Centrifugal, 2 pats.....C. H. Hackett et al
Cream-separators, Liner for centrifugal.....W. W. Marsh
Crib.....M. Segal
Cross-tie, Combination wood and metal.....L. P. Buck
Cultivator attachment.....H. N. Patrick
Current wattmeter, Alternating-, 2 pats.....C. A. Brown
Curtain, Headlight-.....C. A. Pratte
Cutting and pointing machine, Dowel.....L. A. Walker
Cutting device, Hair-.....E. Bocchino
Cycles and bicycles, Stand and carrier for motor-.....F. C. Hoffer et al
Davenport, folding bed, and couch, Combined..J. L. Tandy
Deflector for elevating graders.....W. H. Morenus
Desk.....L. Schram et al
Die.....F. L. Wood
Dispensing-receptacle.....A. S. E. Sanders
Display-rack.....H. P. Meeks
Displaying-machine, Automatic..R. H. Hadfield
Door-fastener.....A. Wicks
Dose-indicator.....J. H. Scott
Dough-molding machine.....J. Dempster
Draft-regulator, Automatic.....S. Ellis
Drawer and locking device therefor, Money-..E. E. Crone
Drawers.....J. Greenwald
Drier.....J. W. Biles
Drill.....J. D. Tully
Duster head, Feather-.....M. E. Goodhue
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Electric-circuit-regulating means....H. Leitner
Electric circuits and their application to railway signaling systems, Combination and management of.....J. Lemire
Electric conductors, Ground-joint connection for, 2 pats.....J. C. Vogel
Electric horn.....D. P. Perry
Electric insect-destroyer.....T. C. Cheney et al
Electric machine, Alternating-current commutator dynamo-.....D. Doinikoff
Electric motor.....G. W. Richardson
Electric sterilizer for food products.....M. R. Frei
Electric switch.....M. Guett
Electrical condenser.....W. C. Shinn
Electrical-wiring knob.....H. W. Lawrence
Electricity-meter, Prepayment.....G. Hookham
Electroplating apparatus, 2 pats.....A. Van Winkle et al
Elevator-door mechanism.....J. Brombacher
Elevator light-signal.....J. M. Graham
Embroidery-hoop.....F. E. Kohler
Endless elevator.....A. L. Hoover
Engine bed-plate, Beating-...F. H. Bither et al
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Engine spark-timer, Gas-.....H. N. Motsinger
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Excavator.....J. B. Webber, Jr.
Explosive-engine.....W. O. Worth
Explosion-engine, Two-cycle.....H. C. Suckert
Extension-table.....C. H. Johnsen
Eyeglass-mounting.....J. M. Chappel
Eyelet and the like setting machine.....E. B. Stimpson
Farm-gate.....G. W. Ripley
Faucet.....P. F. Cavanaugh
Feeding apparatus.....G. C. Eaton
Fence-making machine, Wire-.....J. Harris
Fence, Portable.....G. W. Walters
Fiber from its seed and impurities, Cleaning and separating kapok.....F. C. Gammons
Filter.....G. W. Nütz
Fire-tank.....J. W. Kane
Firearm cylinder-lock.....A. C. Wright
Flasks, Attachment for vibrating devices for molding-.....J. S. Perry et al
Fountain-divider.....R. R. Page
Fume-condensing apparatus.....L. C. Laurent
Fumigator.....H. W. Curtis
Furnace air-preheater.....H. J. Parker
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Furnace construction, Brick for.....A. Cotton
Furnace-protecting envelop.....F. Pin
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Furrow-opener.....S. A. Pogue
Fuse, Projectile-.....H. Maxim
Gage and scriber, Carpenter's.....A. Krehlik
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Game device.....S. C. Steinhardt et al
Game-piece.....E. L. Chesebro
Garbarge-burner and water-heater, Combined..J. J. Dubé
Garden implement.....P. G. Gesford
Garment-protecting device.....W. J. Reid
Gas and gasolene burner, Combination.....G. A. Manshardt
Gas-burner for water-heaters..H. S. Humphrey
Gas-burner smoker-bell.....J. Hill
Gas generator, Acetylene-.....C. L. Betts
Gas-igniter, Pressure-controlled....E. Zickwolff
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Gate.....D. Warner
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Glove-tree.....W. J. Fenohr
Grain cleaning and separating machine.....A. N. Arneson
Grain-shocker.....E. Cowin
Grinding-machine knife-holding attachment.....A. Schwantes et al
Grinding-mill.....F. Nolte
Hacksaws, &c., Manufacture of.....J. Neill
Hammer-drills, Drill-hole-cleaning attachment for.....D. S. Waugh
Hammock-support, Folding.....J. H. Emmert
Harrow-disk, Skeleton.....E. M. Kramer
Harrow-riding attachment.....C. S. Sharp
Harvester, Fruit-.....A. Wettengel
Hat, coat, and umbrella lock.....G. W. Lord
Hat-pressing machine.....R. E. Adam
Hay-press.....C. H. Ruggles
Hay-rake.....J. W. Latimer
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Horse evener, Four-.....W. A. Temple
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Luhricator.....E. A. Emery
Mail-bag catcher.....E. H. Short
Mail-hag-collecting device.....H. Hoffmann
Mail-bag receiver.....J. A. McCurdy
Mail catcher and deliverer.....E. Britton
Mail-sack-delivering apparatus.....C. J. Rinderknecht
Manure-loader.....R. J. McKinley et al
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Marking-machine.....G. M. Diehl
Match-box.....G. Johnson
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Measuring implement.....J. Larson
Measuring-machine.....E. E. Chain
Mechanism from a distance, Apparatus for operating.....G. Gabet
Melting furnace, Brass-.....A. C. Jackson
Metal-dipping machine.....C. F. Neureuther
Metal plates, Mechanism for doubling or matching.....C. W. Bray
Metal receiver, Molten-.....H. H. Campbell
Metal sheets or plates, Doubling apparatus for.....C. W. Bray
Metallic-bung washer.....A. J. Shone
Metallic wheel.....J. R. Fouch
Milking machine, Cow-.....A. V. and R. L. Hinman
Mill housing, Rolling-.....S. E. Diescher
Mine-timber.....Z. Z. Ansbach
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Pan and holder, Evaporating-...H. A. Stemmer
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Paper-clip.....A. W. Friskey
Paper-feeding-machine attachment.....J. Kleidmann
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Parachute, Rocket-.....N. W. Aasen
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Perforating machine, Sheet-.....H. K. Sandell
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Piano, &c., Automatic, 2 pats.....J. A. Weser
Piano-player automatic attachment..F. P. Smith
Picture-hook hanger.....C. W. Holtz
Pie trimmer and crimper.....J. W. Butler
Pile-cutting-machine stop-motion.....C. G. Gildard
Pile fabric.....W. Pearsall
Pipe-hender.....J. R. Williams
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Pipe-joint packing.....W. S. Farrington et al
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Pliers.....H. R. Hendrickson
Plow.....W. P. Wigley
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Plow cutter-stay.....J. C. L. Adams
Plow flanger, Snow-.....H. E. Parsons
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Power-hacksaw.....R. C. Berry
Power-transmitting mechanism.....D. M. Kyle
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Rail-clip.....L. F. Braine
Rail-handling machine.....B. F. Brown
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Railway-lantern.....A. McDonald
Railway-rail joint.....M. J. MacKinnon
Railway-tie.....C. W. Bridgegum
Railway-tie, Steel.....A. W. Jenkins
Range and stove water-heater.....B. B. Culver
Ratchet-coupling, Automatic...R. H. Danzinger
Razor.....G. L. Truitt
Record and file, Card.....W. O. Johnson
Recording device.....A. B. Herrick
Refrigerator-lining.....A. J. Nutter
Regulators, Cleaning feed-water....T. Keenan
Reversing mechanism.....H. P. Yost
Rock-breaker, Subaqueous.....C. L. Rowland
Roll, Crushing-.....T. L. and T. J. Sturtevant
Rotatable table.....A. M. Stover
Rule, Slide-.....W. L. E. Keuffel
Ruling mechanism.....D. W. Custer
Sad-iron support.....E. T. Jarrett
Safety-lock.....J. Herr
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Sash fastener, Window-.....J. S. Rapson
Sash-holder.....F. Lenkey et al
Sash-lock.....O. Gunther
Saw.....J. Neill
Scale, Automatic grain-.....F. L. Smith
Score-board.....J. P. Keenan
Scoring-machine.....J. P. Bird
Screw, Set-.....L. J. Molloy
Seat for window-cleaning, Folding.....C. W. Boost
Seed-cleaner and grain-separator.....T. J. Hatfield et al
Semaphore.....J. Erickson

Sewing-machine.....W. M. Ammerman
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Sewing-machine attachment for making zigzag stitches.....A. Morin
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Shade and curtain fixture, Adjustable window.....A. Logsdon
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Shaft-clamp.....M. T. Thomas
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Sheet-metal packs, Opening.....L. C. Steele
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Shoe metal fly-protector.....L. Feinstein
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Show-case, Fly and dust proof.....W. R. Kirk
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Soldering machine, Can-.....S. A. Baker
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Spring-wheel.....S. S. Childs
Springs, Apparatus for rolling spiral or helicoidal.....C. O. Gustavsen
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Stock-feeding apparatus.....S. F. Moore
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Steel-faced articles, Making.....F. Krabbe
Stretching-machine.....C. H. Knapp
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Superheater-boiler.....J. E. Bell
Surface finishes, Removing..G. Dosselman et al
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Switch-operating mechanism...J. A. McCroskey
Switch-throwing crank, Adjustable.....F. C. Anderson
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Talking-machine, 2 pats.....D. J. Hood
Tank indicator, Liquid-.....B. Webster
Tap and drill holder.....C. F. Blake et al
Tar-extractor.....E. H. Earnshaw
Tea and coffee strainer.....A. L. Lindroth
Telegraph system, Keyboard.....C. K. Jones
Telegraphone record-disk.....J. A. Lieb
Telephone-exchange system.....H. G. Webster
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Telephone system, 4 pats.....H. G. Webster
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Telescope, Sighting-telescope for arms and arm with sighting-.....H. Jacob
Thermostatic controller.....C. A. Dunham
Tile-press.....W. P. Meeker
Timepiece-regulator.....R. G. Norton
Tire-cover.....F. C. Brock
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Tires, Means for automatic closing of punctures in pneumatic.....J. Lindharth
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Train-signaling.....J. F. McElroy
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Transmission system.....J. Schling
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Trimming-cutter.....J. M. Merrow
Trolley-harp washer.....H. W. Kimes
Trolley-wheel.....C. F. Black
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Tunnel, Subaqueous.....O. Hoff
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Type-writer attachment.....W. E. Birgfeld
Type-writing machine.....E. F. N. Bransom
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Vehicle wheel, Motor-.....W. H. McDowell
Vehicles, Taxameter or fare-indicator for hired.....P. Richert
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Vibrator.....H. Larsen
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Wagon, Dumping-.....G. B. Kilmer
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Wells, filters, &c., Molded strainer or screen for.....J. R. Freeman
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Window blinds and shades, Combined automatic duster and brake for.F. J. Watkinson
Window-cleaning device.....A. S. Anderson
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Wire-bound box.....E. E. Flora
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Woodworking-machine.....P. J. Joecken
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Wrench.....V. J. Coughenour
Writing-tablet.....M. A. Dress
Zinc-extracting apparatus.....E. H. Shortman

DESIGNS.

Branch box for insulated electric wires.....M. Havens, Jr.
Brooch-pin.....H. W. Fishel
Brushes, mirrors, and similar toilet articles, Back for.....G. H. Berry
Canes, pins, or similar articles, Head for.....I. C. A. Bosworth et al
Chafing-dish.....A. H. S. Swan
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Chair side standard, Opera.....J. Salomon
Metal mesh fabric.....F. J. Lightbody
Neck-ruff form.....T. P. Taylor
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Sheet-metal-pipe elbow.....H. F. Voshardt
Shell for lighting-fixtures.....H. E. Watkins
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Bill-board.....E. T. Fyler
Billiard-cue adjustable tip-holder.....H. Marsh
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Bottles, &c., Capsule for.....F. Jebsen
Bottling-machine crown arranging and presenting device.....H. A. Allwardt
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Brake-shoe.....W. H. Haring
Brake-shoe.....H. Jones
Brake-shoe.....J. S. Thompson
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Breaking, digging, or loosening material to be dredged or excavated, Means for.....E. W. Moir
Bridle-bit.....C. Klaus
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Cabinet-drawer.....H. Somborn
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Cableway.....T. S. Miller
Calendar-roll.....J. Macadam
Call-register.....E. P. Baird
Camera film-spool.....J. H. Haste
Camera panoramic attachment.....F. F. Groff
Camphor, Oxidizing camphol for the making of.....A. Verley et al
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Can-opener.....E. H. Smith
Can-opening device.....K. Lye
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Canning-factory device.....W. S. Thomas
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Car.....C. A. Pratt
Car-combination tramway-.....R. Genovese
Car controller-checking device, Street-railway-.....N. Fallek
Car-door fastener.....M. P. Mahar
Car door, Grain-.....C. L. Smith
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Car-end construction.....C. O. Birney
Car indicator, Traffic-.....A. C. Killius et al
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Car registry device, Tramway-.....A. M. Pries
Car-retarder.....W. H. Finley
Car-seal.....J. F. Wing
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Car-stop.....W. F. Clapp
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Cars, Combination dashboard and shield for tramway-.....R. Genovese
Carbureter.....J. F. Duryea
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Cards, tickets, papers, &c., Holder for.....A. A. Low
Caster, Ball-bearing.....B. C. Woodward et al
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Cement-block machine.....P. A. Lawin
Cements, &c., Making hydraulic, 3 pats.....W. H. Harding
Check-printer.....F. Mutschler
Choke-coil for moving-picture machines.....H. J. Beck
Churn and butter-worker, Combined.....D. A. Sprague
Cigar-receptacle, match-box, and cigar-cutter, Combined.....J. Berg
Clamp.....C. T. Mitchell
Clamp.....A. J. Thomson
Clamping device, &c.....J. H. Hewitt et al
Cleaning and dust-collecting apparatus.....J. T. Hope
Clock, Electrically-controlled secondary.....S. P. Thrasher
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Closet-seat.....M. Bach
Clothes-drier.....S. O. Bestul
Clothes-hanger.....J. G. Madland
Coal-mines and like places, Respiratory apparatus for use in.....W. E. Garforth
Cock shiftable index.....H. Mueller
Collar-fastener, 2 pats.....A. Reed
Combination-lock, Changeable....W. H. Taylor
Compartment-can.....F. M. Clapp
Compass attachment.....J. T. Lihon
Concentrator-actuating mechanism.....W. L. and F. S. Card
Concrete and other like structures, Apparatus for building.....W. C. Polk
Concrete bins, Knockdown form for the construction of.....J. H. Reeves
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Condenser, Barometric.....A. H. Helander
Conduit-wiring appliance.....J. S. Stewart
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Container.....W. Asbury
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Corn, Machine for removing the butt-ends of ears of.....S. E. and W. W. Morral
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Corn separator, Seed-.....C. F. Asplund
Corn-shocker.....I. C. Nolte
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Cultivator and fertilizer-distributer, Combined.....G. E. Alphin
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Current-motor.....A. Nordlund
Curtain-fixture.....J. E. Bosler
Curtain-pole.....J. A. Humes
Cushion.....A. Freschl
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Cutter and scorer.....S. M. Langston
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Designs to cylindrical surfaces, Transferring.....J. Jacobson
Developing, washing, and fixing box.....W. F. Zierath
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Die-stock, Self-oiling..W. M. and I. S. Shreve
Disk-honer.....J. Pfeifer
Disk-sharpener.....W. O. Hardman
Display device.....J. G. Cooner
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Door-stop.....W. B. Hall
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Douche-chair.....S. A. Mendenhall
Dovetailing-machine attachment..H. F. A. Lott
Draft-regulator.....E. Capper
Drawers, Man's.....G. M. Harsh
Drenching device.....H. Riesland
Drier.....R. R. Watters
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Drum-muffler.....J. T. Spawan
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Electric controller.....W. S. Deeds
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Electric gas-range lighter, Automatic.....M. L. Ganser
Electric igniting system.....E. O. Williams
Electric-light switch.....W. W. Fulton
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Rosette.....J. S. Stewart
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Shoe-polishing device.....J. Niemi
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Ticket.....H. L. Kline
Tie-spacer.....J. A. Miller
Tile, Sheet-metal.....F. H. Gross
Time-switch, Automatic.....G. R. Clark
Tire.....E. Kempshall
Tobacco case or cabinet.....W. J. Simanek
Tomb or burial-vault.....T. J. Moore
Tool, Centering-.....J. A. Petta
Tool, Garden-.....A. Jackson
Tool, Graining-.....F. M. Clapp
Tool, Thread-intercutting.....J. Vidina
Tooth, Artificial.....E. H. Ballou
Toothpick-making machine..C. R. Emens et al
Torpedo-launching tube.....A. E. Jones
Torpedo-placer.....E. P. S. Andrews
Trace.....D. McAulay
Traction-wheel.....M. Goodfellow
Transmission mechanism.....R. E. Northway
Transporting apparatus.....C. Krämer
Tray-handle.....H. Seward
Trolley.....J. Franklin
Trolley guard and replacer...J. J. Schultz et al
Trolley-harp.....T. F. Brennan et al
Trolley-switch.....A. Palmros
Trolley-wheel.....C. M. Bradfield
Truck.....W. F. Rachal
Truck, Brick-.....H. H. Walsh
Truck, Car-.....H. W. Wolff
Truck, Equalizing-.....A. E. Brown
Truck, Hay-.....F. A. Kime
Truck, Lumber-.....M. Ackerman
Tube clamp and elevator.....B. Andrews, Jr.
Tubing reinforcement, Metallic-.....L. M. Passmore
Turbine, Elastic-fluid.....S. Z. de Ferranti
Turbine, Elastic-fluid.....O. Krahenmann, Jr.
Type-writing machine.....A. T. Brown
Type-writing-machine tabulating appliance.....H. S. Dukes et al
Type-writing-machine tabulating mechanism.....H. S. Dukes et al
Umbrella.....L. F. Teets
Umbrella, Folding.....F. G. Christensen
Valve.....A. P. Broomell
Valve.....W. M. Fulton
Valve.....A. C. Ricksecker, Jr.
Valve.....A. C. Ricksecker
Valve.....F. E. Guyott
Valve.....R. Koch
Valve.....A. Lotz
Valve for furnaces, Reversing-.....J. C. and J. A. Swindell
Valve for steam-boiler water-gages, Check-.....W. D. Gelser
Valve mechanism for closet-bowls.....C. M. Eckland
Vault, Burial-.....W. B. Hall
Vehicle driving-wheel, Electrically-propelled-..D. Balachowsky et al
Vehicle-fender.....A. L. McGregor
Vehicle, Motor-driven..H. B. Molesworth et al
Vehicle steadying device.....E. A. Sperry
Vehicle suspension system.....C. W. Larson
Vehicle, Toy.....W. H. Fahrney
Vehicle-wheel.....H. M. Specht
Vehicle-wheel.....T. Newman et al
Velocipede.....C. C. Cleverdon
Vending-machine.....S. Kleinman
Ventilator.....F. C. Kasch
Vessels, Raising sunken.....S. Lake
Vulcanizing-mold.....J. K. Williams
Wagon, Dumping-.....H. W. Neal
Wagon end-gate.....H. M. Sheldon
Wall-tie.....T. J. McDonald
Washing-machine.....W. C. Foster
Washing-machine.....W. D. Whitney
Washline-hanger.....H. Gillar
Watch-bow.....H. Ginnel
Watchcase.....F. Jacobson
Water-closet seat.....J. T. Knott
Water-closet ventilating device...W. H. Cline
Water-gage.....J. O'Connor
Water-heater.....J. A. Dillon
Water-heater.....J. F. Miles
Water-heater.....C. A. Wood
Water-strainer.....H. Mueller
Water-tank.....C. H. Van Wagoner
Wheel.....A. B. Day
Wheel clip attachment, Fifth-.....W. A. Schleicher
Wheel regulator, Tangential-water-.....J. M. Boyle et al
Wheel-truing brake-shoe.....J. M. Griffin
Whip-socket lock.....H. R. Arnold
Whistle.....H. W. Aylward
Wick for wax matches, tapers, candles, &c.....J. E. and G. W. Glenister
Winding-drum rope-guide.....S. H. Libby
Windlass.....A. D. Hulburt
Window.....A. Corbeille
Window-closing device, Automatic.....D. MacVicar et al
Window-lock.....C. Rosine
Window-screen.....T. L. A. Hellwig
Wire fabric.....O. H. Stuewe et al
Wire reeling and unreeling machine...J. Brott
Woodworking-machine.....P. J. Joecken
Wrench.....H. B. Winfield

DESIGNS.

Automobile-lamp casing.....H. Saxon
Bottle.....G. B. Beiderhase
Bottle.....S. Loewenthal
Brooches, scarf-pins, or similar articles, Head of.....Z. Freund
Electric-fuse case.....T. E. Murray
Emblem.....A. Schickerling
Neck and chest protector.....J. S. Mead
Pen-box, desk-tray, and paper-weight.....C. R. Smead
Plate.....E. E. Walter
Souvenir-badge.....D. M. Westcott

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Acetylene-burner.....A. Bray
Acid, Making sulfuric.....H. Petersen
Advertising apparatus.....W. F. Gill
Advertising automaton.....D. F. Brown
Advertising device.....W. K. Salter et al
Aeronautic apparatus.....G. A. Metcalf
Agricultural implement.....A. C. Anderson
Air-brake attachment.....T. J. Crawford
Air-compressor automatic governor.C. Norland
Air-lock.....H. Japp
Alfalfa-grinder.....T. Ponsar
Alkali-metal amalgams, Apparatus for decomposing.....C. F. Carrier, Jr.
Animal-cleaning apparatus.....C. Hammer
Anncaling-box.....J. F. Campbell
Annealing-furnace.....J. C. Swindell
Ash-receptacle.....A. Eichler
Automobile.....J. L. Fay
Automobiles and other vehicles, Safety fender or guard for.....F. J. Graf
Awning-frame.....J. W. Richards
Awning-rollers, &c., Intermediate support for..J. H. Channon
Bag-seal.....E. J. Brooks
Ball-mill.....R. Beneke
Bandage-support.....C. M. Cooke
Barrel construction, Molded.....J. H. George
Barrel-stand.....R. Dumesnil
Barrels, Machine for cutting head-linings for..L. Y. Williams
Bath-tub trap and outlet construction.....J. F. Eichenlaub
Bearing, Ball-.....G. O. Leopold
Bed-spring.....W. W. Vincent
Beds, &c., Gate for.....H. and A. Thurm
Bedsteads, Lacquering.....W. W. Vincent
Beer-tapping device.....P. F. Cox
Bell, Call-.....S. Katz
Beverages, Composition of matter for use in preparing fermented.....M. Wallerstein
Binder shocking attachment.....W. H. Perrin
Binder, Temporary, 3 pats.....L. M. Morden
Blade-sharpening apparatus.....J. W. Leslie
Block-mold.....H. Bresser
Board gage, Multiple-.....B. D. Stevens
Boiler.....H. O. Keferstein
Boiler feed-water, Apparatus for treating.....M. Miller

Boilerfeeding apparatus.....N. E. Nash
Boiler-furnace.....P. H. McGiehan
Boiler, Superheater-.....J. C. Parker
Boiler-tube-cleaner nozzle.....R. W. Hamann
Bolting machine.....A. H. McCutcban
Book, Key-.....M. C. Elliott
Book-making machine.....G. A. Walstead et al
Book-strap handle.....H. Backstrom
Bottle.....F, C. Turner
Bottle, Non-refillable.....M. V. Whiting
Bottle-rinsing machine.....E. Court
Bottle-stoppering-machine attachment.....M. H. Mulkey
Box.....J. A. Liebler
Box.....T. L. Morgan
Bracelet.....E. L. Anderson
Brake-shoe.....J. F. Norman
Bridges, pillars, &c., Compressive and tensile bar for.....W. Lübbecke
Briquets, Treating.....B. Wagner
Brooder or foster-mother for chickens.....R. Miller
Broom-holder.....E. M. Gildemeister
Brush.....L. O. Ekrem
Brush.....A. R. Wiens
Brush, Dusting-.....J. H. Channon
Buckle.....D. de Lancey
Bung-extractor.....T. Thornburg
Burglar-alarm.....J. Wells
Burial-receptacle.....J. H. Todd
Burner.....I. F. Zimmerman
Butter, Manufacture of.....J. V. M. Risberg
Button-setting machine.....D. A. Carpenter
Button-setting machine.....C. Wooster
Cabinet.....I. H. Athey
Calculating-machine.....W. R. Bonham
Calliope, Pneumatic.....S. V. Day
Cam-wheel, Adjustable.....G. H. Mallam
Camera film-pack holder.....A. H. Wright
Car antifriction center-bearing, Railway-.....J. F. O'Connor
Car antifriction side bearing, Railway-.....J. F. O'Connor
Car, Ballast-plow.....H. S. Hart
Car-coupling.....C. A. Dunn
Car coupling, Mine-.....T. C. Nation
Car-door fastener.....F. O. Dohlin
Car draft-rigging.....F. L. Barber
Car, Dump-.....S. Otis
Car grain-door, Railway-.....M. Paulson
Car, Hand-.....M. B. Lloyd
Car, Push-.....G. C. Wortman
Car side stake.....W. S. Atwood
Car, War-.....D. W. Meacham
Car-wheel.....P. J. Garrison
Car wheel, Mine-.....J. T. Parks et al
Cars or other vehicles, Antifriction-bearing for railway-.....J. F. O'Connor
Cars, &c., Self-locking seal for...I. C. Reesor
Carpet-stretcher.....W. Fagan
Cart, Folding.....F. G. Lyons
Carton-filling machine.....J. B. Fallon, Jr.
Carving-machine.....M. A. Cuming
Cast-off.....J. F. Molloy
Casting.....H. D. Zehrbach
Cattle-guard.....J. McCluskey
Cellulose solutions, Production of.....E. Crumiere
Chain, Conveyer-.....G. F. Conner
Chain, Drive-.....B. G. Berrien
Chair-iron.....H. W. Bolens
Check-canceling box, Waiter's-.....J. T. Hicks
Cheese-cutter.....W. A. McElney
Chicken-picking device.....D. A. Bainter et al
Churn.....I. Bauer et al
Churn.....R. Moody
Churn.....W. W. Bland
Churning apparatus.....F. L. White et al
Cigars, Packing.....C. G. Singley
Clamp.....O. B. Perkins
Clip.....F. R. Baker
Clock.....E. A. Bazzett
Clock-dial.....R. V. Longtine
Clock lockwork, Striking-.....C. M. Gearing
Clock, Time-registering.....J. and A. Dey
Cloth, Gummed.....E. G. Lang
Cloth tbin-place detector..H. L. Freeman et al
Clothes-drier.....W. S. Morgan
Clothes-line reel.....A. Woitynek
Clothes-pounder.....R. H. Standing
Clutch, &c., Electrical.....A. P. Steckel
Coal-cutting macbines, Dust-preventive attachment for.....A. E. Wood
Coaster-brake, Back-pedaling.....F. S. Ellett
Cock, Stop-.....W. G. Westwater
Coherer.....F. G. Sargent
Collapsible bracket.....H. Lanham
Collar, Shirt-.....C. Ryan
Collecting and delivering apparatus, Automatic.....D. M. Main
Combination-lock, Keyless.....S. J. Nielsen
Combined table.....J. L. Nail
Concentrating apparatus.....M. E. Darrow
Concentrating-table.....W. G. Dodd
Concrete construction for piers and docks, Reinforced.....E. C. Lawrence et al
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Concrete manhole-cover, Reinforced.....J. P. Rogers
Condenser.....J. S. Stone
Conveyer, Foldable.....C. A. Radcliff
Conveyer, Making helicoid or spiral.....C. O. Gustavsen
Conveyers, Machine for making helicoid or spiral.....C. O. Gustaysen
Cooker, Steam-.....S. J. Finch
Cooking.....C. B. Trescott
Cooling structure.....P. G. Toepfer
Cork.....E. Tugendreich
Corset.....V. E. Mack
Corset-clasp fastener.....C. F. Plummer
Cotton-boll gatherer.....J. F. Appleby
Cotton-compress machinery.....H. Jones et al
Cotton-picking finger.....J. R. Appleby
Cotton-seeds, &c., Apparatus for coating.....L. C. Bulkley
Crank and yoke connection.....F. C. Olin
Crate.....J. M. Enyart
Crate, Collapsible.....H. A. Forkner et al
Cream-bowl cover.....M. B. Barron
Crib.....V. Philia et al
Crutch attachment.....J. W. Ricks
Cue-chalker, Automatic....W. F. Clayton, Jr.
Cuff-holder.....C. P. Clark
Cultivator.....P. Lochtin
Cultivator, Celery-.....W. L. Bonney
Curtain or shade fixture, Adjustable.....A. A. Smitb
Curtain-stretcher.....C. W. Ballou
Cutter-guard.....A. Rasmussen
Cutter-head, 2 pats.....G. Roussell
Cycle changeable-speed gearing, Motor-.....C. H. Lang
Dental plate.....E. Telle
Dental plate and manufacturing tbe same.....E. Telle
Dental plates, Attaching teetb to.....E. Telle
Deposit and collection receptacle...J. Hartman
Dish.....W. C. Anderson
Dish-mop.....C. A. Mason
Disinfectors, Interior container for drip-.....Z. G. Sboles
Display-rack.....H. B. Cloud
Door-check.....M. J. Flynn
Door-hanger.....G. A. Swineford
Door-hanger, Adjustable.....V. A. Benson
Door-hanger track.....H. L. Ferris
Door lock, Sliding-.....A. C. Kreutzer et al
Door operating mecbanism, Dumping-.....F. Seaberg
Door-securer.....F. F. and M. F. Dunn
Double bit.....J. G. Williamson
Drain-pipe, Metal.....J. A. Sanders
Drawbridge.....M. Waddell
Dredge, Gold-.....H. J. Clark
Dredge suction-mouthpiece.....H. J. Clark
Dress-form.....C. A. Ufford
Drill.....D. W. Rowlands
Drinking-cup.....C. C. Sprinkle
Drinking-fountain, Automatic.....K. Seiter
Duplicating-machine, Rotary.C. A. Glover et al
Dust-extractor, Portable vacuum.C. J. Harvey
Dye and making same, Monoazo...W. König
Egg-case fastener.....J. H. Scbneider
Egg-crate.....S. A. Hamilton
Electric bell.....E. P. Steen
Electric block-signal..J. G. O. and I. D. Combs
Electric fan, Oscillating, 2 pats...H. S. Brown
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Electric machine, Dynamo-.....E. T. Mug
Electric-machine electric-current governor, Dynamo-.....L. Rosenbaum et al
Electric machine of the inclosed type, Dynamo-.....C. E. Lord
Electric motor.....J. Burke
Electric railway-signal.....C. H. Smith
Electric signal-bell.....H. W. Eden
Electric switch, Rotary snap...C. G. Perkins
Electrical connector.....G. A. Schreier
Electrical heating apparatus..E. L. van Dolsen
Electrical ignition apparatus.....J. A. Torrens
Electrical spark apparatus.....E. C. Wilcox
Electrically-controlled lock.....W. H. Stevens
Electricity and gas, Fixture for..G. H. Jones
Electrolier.....J. H. Thompson
Electrolytic slimes for the recovery of metals therefrom, Treating.....A. J. McNab
Electroplating apparatus.....C. G. Backus
Elevator.....C. C. Rittenbouse
Emergency-lock.....L. R. Hopton
Engine, 2 pats.....F. D. Howe
Engine.....R. J. A. and J. N. Prince
Engine carbureter, Explosive-, 2 pats.....L. P. Fosnot
Engine-indicator.....W. E. Jerauld
Engine starter-crank, Explosive-...F. W. Coen
Engine valve-lifter, Explosive-...J. E. Gaylord
Envelop.....P. M. MacKaskie
Envelop, Accounting-.....W. C. Hocking
Evaporator.....C. L. Schalitz
Excavating, grading, and conveying machine..P. J. Thull
Exhibiting-machine.....G. E. Heyl-Dia
Explosion-engine, Rotary.....E. M. Weinat
Explosive-engine.....O. E. Barthel
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Eyeglasses.....B. Broughton
Eyeleting-machine.....H. H. Eaton
Eyeleting-machine.....G. Knight
Fabric, Woven pile.....A. G. Robertson
Fan-blast regulator.....O. Anderson
Fan, Traveling.....F. B. Thilow
Feed-bag.....A. Tbiel
Fence-gate.....C. D. Haldeman
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File, Letter-.....J. J. Dettwyler
Fire-alarm.....G. P. Leonard
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Fire-kindler.....M. Sendlein
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Fluid-pressure, Device for shutting off.....E. J. O'Malley
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Frame corner and fastener.....W. Goodrow
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Fruit-seeder.....F. Lyman
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Furnace grate and ash-pit.....C. Smith
Furnaces, &c., Apparatus for charging and distributing the stock in blast-..W. C. Mitchell
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Game apparatus.....F. R. Cornwall
Game apparatus.....W. H. Maynard
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Garment, Combination-.....E. J. Quigley
Garment-fastener.....C. A. Law
Garment Lady's.....A. W. Powell
Garment-stay.....J. J. Laass
Garter.....L. S. Harvey
Gas-burner.....J. Y. Parke
Gas-burner Electric-lighting...H. L. Baldwin
Gas generator, Acetylene-.....M. L. and G. W. Rice
Gas-producer.....J. A. Smitmans
Gas-producer control.....B. E. Fildred
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Gases and separation of air commercial oxygen and nitrogen, Apparatus for liquefaction of..G. A. Bobrick
Gases, Apparatus for treating distillation-.....L. Wolf
Gasket, Metallic.....P. D. Shade
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Gear or the like, Diving.....A. Neubert
Gears, Draw-bar and yoke fastening for draft-.....G. O. Hammond
Gearing, Differential drive-....N. M. Anderson
Gearing, Power-transmission...H. D. Williams
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Generator feeding device, Acetylene-.....J. K. Rush
Glass tiles, Apparatus for manufacturing.....W. T. Nicholls
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Grain-drill tooth.....G. and M. Smith
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Hand, Artificial.....A. F. Nelson
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Harvesting-machine.....W. Livtschak
Hat and coat rack.....E. L. Pitts
Hat-pin.....M. Rosengarten
Hay-stacker.....H. M. Underwood
Head-gate.....J. R. Crabtree
Hinge.....W. C. Boswell
Hog-ringer.....E. G. Burkhart
Hoisting-engine.....C. Campbell
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Hook and eye.....C. W. Breen
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Hose-coupling.....C. E. Lepage
Hose-repairing plug.....A. L. Monaghan
Hospital-cup.....H. J. Potter
Humidifier and air-moistening apparatus, 2 pats.....S. W. Cramer
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Illuminating device.A. W. Beuttell. (Reissue.)
Ink-well.....A. E. Carlson
Insetting mechanism.....H. G. La Sor
Insulator.....F. J. High
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Lamps, Manufacture of glowing bodies of refractory metals for electric.....A. Lederer
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Lathe structure.....F. Hardinge
Laundry-marking machine.....T. J. Hume
Lavatory-plug and means for operating the same.....B. N. Miles
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Lift-strap for recumbent patients...D. Curtin
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Light-fixture.....A. C. Cooke
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Mail-bag catcher and deliverer..L. W. Melchior
Mail-bag catching and delivering apparatus.....H. J. Amick
Mail-box.....A. F. Ripple
Mail-box.....M. Brown
Mail-catcher.....H. C. Wehling
Mail catching and delivering apparatus.....A. H. and F. C. Snyder et al
Mail delivery and receiving device.....H. C. Webling
Mail receiving and delivering apparatus.....A. F. Wrigbt
Manicurist's buffer.....E. M. Weatherbee
Marker, Laundry-.....G. L. Dixon
Massage apparatus.....H. Ginnel
Match-holder.....W. C. Kelley
Match-safe.....E. G. White
Match-safe.....E. E. Sanders
Mattocks and similar tools, Making.....G. F. Konold
Meat-cutter.....A. A. Warner
Meat slicer and cutter, Combined.....J. Winkelmeyer
Mechanical movement.....W. F. Zimmermann
Metal, Forming expanded.....W. H. Cooley
Metal tie.....B. C. Murray
Metal-work machine.....G. P. Thomas
Metallic hoop.....W. Goldie
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Mine automatic cage-loader and safety device..J. W. Brannon
Miner's candlesticks, Attachment for.....S. M. Thurman
Motor.....A. E. Guy
Motor.....J. Schroeder
Motor.....W. C. Whitcomb
Mower, Lawn-.....J. Urbanick
Mower or harvester sickle-guard.....W. Gaterman
Musical instrument, Mechanical.J. McTammany
Musical instrument, Self-playing...F. E. Ives
Musical-instrument tracker-board, Pneumatic-..A. Philipps
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Necktie.....H. Hagen
Noise-preventer for covers of receptacles.....T. B. Garris
Numbering-machine.....W. A. Porter
Nut-lock.....R. L. Mangan
Nut-lock.....J. B. Hoagland
Nut-lock.....L. A. Smith
Nut-lock.....G. W. Stuart
Oiler, Floor-.....A. Weber
Ore-crusher.....C. O. Michelsen
Ores and other materials, Apparatus for disintegrating.....H. W. Hardinge
Oxone, Apparatus for preparing.D. E. Parker
Package-binder.....M. H. Buffington
Packing, Moisture-proof.....R. V. Collins
Pad composition, Copying.....R. O. E. Davis
Paper-delivery mechanism.....W. T. Bailey
Paper-folding machine.....C. A. Sturtevant
Paper, Machine for forming busbing-plugs for rolls of.....O. O. Judd
Paper-trimmer.....J. G. Breckenridge
Pencil-holder.....C. H. Wilken
Photographer's dark room.....V. Sekinger
Photographic developing apparatus, 2 pats.....D. James
Photographic posing device....F. W. C. Pohle
Piano and organ box.....A. W. Landon
Picture-frame fastening.....J. M. Pullen
Picture or similar frame.....W. S. Morton
Pipe.....H. Leidel
Pipe connector, Train-.....F. H. Rutherford
Pipe cooling and trimming apparatus, Combined.....G. Duncan
Pipe-coupling.....C. R. Schmidt
Pipes, Preparing corncobs in the manufacture of.....G. F. Hausmann
Piston.....W. J. Armstrong
Plant, Retting.....A. Cappelaere
Planter.....E. M. Cole
Planter seed-dropping mechanism, Corn-.....T. C. Roseland
Plug machine, Spike-hole-.....F. V. Carman
Pocket-lighter.....S. B. Battey
Polishing-machine.....F. H. Dickson
Powder for use in making overlays..A. R. Little
Power-transmitting device.....A. C. Albertson
Press valve-operating mechanism.....J. M. Sheppard
Primers, Charging of.....F. Hyronimus
Printer's-cbase registering device.W. A. Howe
Projection apparatus.....E. W. Goodrich
Pulp articles, Apparatus for making.....M. L. Keyes
Pulp-screen.....N. Magnant
Pulverizer and leveler.....T. V. Barnard
Pump, circulator, and like appliance.....J. Brundrit
Pump for electrolytic cells, Circulating.....C. F. Carrier, Jr.
Pump-valve.....J. Greer
Punching machine.....G. P. Thomas
Radiator-carrier.....A. F. Buell
Radiator-nipple.....J. A. Field
Radiators, Automatic control of heat from.....J. B. McKeown
Rail clamp and brace.....A. F. Shaner
Rail fished joint.....J. Baka-Abakowsky
Rail-joint.....B. Wolhaupter
Rail-joint.....F. H. Richards et al
Rail-tie.....E. C. Culver
Railway automatic safety signal system.....G. B. Gray
Railway-gate.....J. G. O. and I. D. Combs
Railway protective system, Electric-.....A. C. Eastwood
Railway-rail joint..M. J. and R. A. Drummond
Railway-switch.....W. P. Finley
Railway switch and signal.....T. L. King
Railway-tie.....W. McCloy
Railway-tie.....W. Gabriel
Railway-tie.....A. Searway
Razor-blade-sharpening device.....J. W. Leslie
Razor, Safety-.....J. W. Leslie
Razor, Safety-.....M. T. and C. T. Heil
Razor-strop, Hand.....C. Ballreich
Receiver.....C. G. Asbley
Reclining-chair.....J. Findall
Recording speech.....W. J. Keboe
Reflector.....A. J. Brown
Respirator.....N. Lambert
Rifle, Automatic.....J. Warnant-Créon
Room heater and ventilator, Individual.....F. H. Schuppener
Rope-reel.....G. W. Cavell
Rotary engine.....A. J. Charlton
Rubber, Manufacture of.....M. Wilderman
Rule, Extension-.....C. K. Denman et al
Sad-iron, Self-heating.....C. C. Sprinkle
Safe.....T. S. Spivey
Safe and vault doors, Mounting heavy.....G. L. Damon
Safety-pin.....S. Olop
Sap-spout.....G. G. Cbasse
Sash-lock.....G. Jayme
Sash lock or holder.....J. B. Foley
Saw-handle.....H. M. Rounds
Scaffold, Folding.....F. McCarty
Scraper.....J. D. Vasey
Screw cutting and turning lathe, Automatic...J. Coulter
Scrubbing machine, Floor-.....A. Grub
Scythe.....J. Huss
Seat and desk, Combined scbool..O. C. Evans
Sewing-awl.....C. A. Stewart
Sewing-machine.....J. C. Goodwin
Sewing-machine shuttle.....H. A. Bates
Sewing-machine thread-trimming device.....H. W. Slater
Sewing-thread and making the same.A. Hendry
Shade and curtain hanger.....C. H. Peterson
Shaft-hanger.....C. W. Levalley
Sheet-metal-coating apparatus...S. E. Andress
Sheet metal, Machine for cutting and corrugating.....W. H. Cooley
Sheet metal, Machine for expanding.....W. H. Cooley
Shelving.....H. Hoffman
Shipping-case, Collapsible...G. O. Helvig et al
Shock-absorber.....R. Huber
Shoe-fastener.....C. C. Sprinkle
Shoe-machine lubricator.....W. A. Banfill
Shoe, Ventilated.....W. Shaw

Show-case....P. Thompson
Side-delivery rake....W. R. McGawen
Sifter, Automatic ash-....E. J. Deegan
Sifter or screen, Adjustable....H. H. Skagen
Sign....J. N. May et al
Sign....L. M. Schoonmaker
Signaling-apparatus circuit-breaker, Automatic-....E. A. Everett
Signaling system....S. A. Reed
Signals, Apparatus for receiving submarine....C. H. Mundy
Signatures, Forming....C. A. Sturtevant
Skate....O. Arlund
Sled, Bob-....A. Gunderson
Slicing-machine....E. F. Smith
Slugs or fastenings, Machine for inserting....G. A. Ambler
Smoke-consuming furnace....L. A. Milbank
Snap-hook....F. W. Covert
Snap-hook, Breast-strap....J. C. Covert
Soap, &c., Apparatus for the manufacture of rosin....A. W. Carmichael
Soap, &c., Manufacture of rosin....A. W. Carmichael
Sound-box....W. J. Tanner
Sound-reproducer....R. B. Smith
Sound-reproducing machine....C. I. Lamb
Sound-reproducing record....E. Leschbrandt
Spacing-machine....G. P. Thomas
Speed-indicator....H. Poth
Speed mechanism, Variable-....A. W. Pupke
Speed of prime movers, especially turbines, Method and device for electrically regulating the....F. von Merkl
Speedometer attachment....J. W. Jones
Spouts, Device for adjustably holding flexible....G. W. Warner
Spring....J. M. Waugh
Spring manufacture....S. W. Baldwin
Square, Tailor's....H. W. Ratner
Stacker, Telescoping straw-..J. R. Buckwalter
Stair, Counterbalanced....P. L. Larson
Stair-rail-projecting device....C. F. Weichold
Stamp-canceling-machine inking mechanism....S. J. Evans
Stamping machine, Card-....W. W. Hodgson
Steam-engine....J. Stumpf
Stirrup, Sulky-....L. D. Morton
Stoker, Automatic....H. Clouston
Stool, Collapsible....J. A. A. Johnson
Stove....G. M. Adams
Stove, Gas-....C. L. Dickerman et al
Stove, Oil-....W. R. Jeavons
Strainer....H. F. Fowles et al
Street-cleaning apparatus....C. F. Speice
Stud-wrench....T. Longdin
Studs, pins, &c., Retaining device for....R. H. Low
Superheater-boiler....J. E. Bell
Support and hanger, Curtain....W. Luft
Suspension-hook....J. B. McIntire
Swing, Lawn-....J. C. McVey
Swingletree-guard....T. L. Harris
Switch-lock, Automatic....C. E. Duffie
Switch-operating mechanism....A. De Witt
Switching apparatus, Thermostatic....W. V. D. Kelley
Syringes, &c., Nozzle for, 2 pats.H. A. Kaysan
Tailor's indicator....H. H. Woolson
Teeth, Composition of matter for nerve-canals in....H. J. Bowerfind
Telegraph-circuit at a distant key, Means for closing an open....C. B. Jewell
Telegraphy....P. B. Delany. (Reissue.)
Telegraphy, Space....S. Cabot
Telegraphy, Space....J. S. Stone
Telephone attachment....N. B. Parsons et al
Telephonehood....H. L. Burrhus
Telephone-receiver....J. T. Curtis
Telephone system, Three-wire...C. S. Winston
Telephone-transmitter....C. D. Enochs
Tempering apparatus....J. G. Matthews
Testing apparatus....F. H. Stillman
Ticket-holder....J. J. O'Neil
Tile-machine....J. M. Schenk et al
Time-limit annunciator and register....A. Sanders
Time-recorder, 4 pats....J. and A. Dey
Time-recorder, Watchman's....J. and A. Dey
Tire, Pneumatic....J. L. Newell
Tobacco-pipe....A. Boisaubin
Tomato-knife....F. L. Smiley
Tool and apparatus for dressing, turning, and shaping stone, emery-wheels, and the like....F. Trier
Tool, Cutting-....C. T. Ridgely
Tool-holder....W. M. Rhoades
Tool, Motor-actuated hand-, 2 pats....W. C. Whitcomb
Tool, Portable electrical....F. J. Backscheider
Tooth, Artificial....S. S. Bloom
Top-roll mechanism....L. T. Houghton
Toy....J. H. Rese
Toy, Collapsible....A. Klein
Trace-connector, Adjustable....A. R. Erwin
Track-sander....J. W. Brady
Track-tie, Reinforced concrete....W. Gabriel
Tracker-board....R. S. Gourlay
Train-order-delivering apparatus.J. M. Butcher
Transporting apparatus....F. L. Beamond
Trim-fastening....A. C. Goddard
Trolley-harp....J. Wickstrom
Trolley-pole attachment....H. W. Eichbaum
Trolley-retriever....N. W. Chamberlin et al
Trousers-expander....J. Sargh
Truck....H. J. White
Truck end-casting construction, Car-....O. S. Pulliam
Truss....C. A. Jensen
Truss....J. S. E. Freel
Turbine....R. K. Morcom et al
Turbine, Elastic-fluid....J. A. MacMurehy
Turbine, Radial....B. Ljungstrom
Type-casting machine....J. S. Thompson
Type-checker....W. H. Kolvenbach
Type-perfecting machine....H. S. Wilson
Type-writing machine....B. C. Stickney
Type-writing machine....J. Felbel
Type-writing machine....G. A. Seib
Unhitching device....J. Lusk
Utensil-cleaner....A. Silverglade
Valve....J. R. Dolph
Valve mechanism for steam-engines..L. Miller
Valve, Pressure-holding....B. A. Chew
Valve-push-rod mechanism..H. F. Odenkirchen
Valve, Rotary....L. A. Frayer et al
Valve-seats, Device for refacing....H. S. Clark et al
Vapor-burner....J. T. Jordan
Vehicle-axle....T. D. Jones
Vehicle, Dumping-....J. W. King
Vehicle running-gear....J. H. Hand
Vehicle-wheel....G. A. Budge
Vehicle-wheel....C. Stanley
Vending-machine, Coin-controlled....E. F. Schneider et al
Vending-machine coin-controlled delivery mechanism....C. M. Linde et al
Ventilator....D. J. Kelly
Vermin, Apparatus for the disinfection and the extermination of....G. Gauthier
Violin chin and shoulder rest, Combined....G. L. Becker
Voting-machine, 2 pats....J. H. McElroy
Wagon rack or box lifting device.G. A. Peters
Wagon, Salvage-....J. O. Glanville
Wagon-starting device....W. H. Stewart
Wagon-tongue attachment....G. Hofmaister
Washing-machine....P. Schneider
Waste-basket....W. H. Knobloch
Watch-holder, Pocket....R. F. Pike
Watch-pocket....R. A. Stone
Water and sewage through tunneled streets, System for conducting....J. J. Eagan
Water-heater....E. H. Steele
Water-jacket, 2 pats....C. W. Hawkes
Weeding device....B. F. Paxton
Weight-relieving device....O. L. Owen
Well bailer, Oil-....D. Kimmel
Wheel-rim serving as tire-retainer, Divided....R. Kronenberg
Wheel-tire....T. Midgley et al
Wheels, Machine for cutting the teeth of bevel-....S. Sunderland
Whiffletree-hook....A. F. Crosby
Whip-socket, Locking....J. Olsafskie
Whisky-still....J. F. Jett
Winding-machine....P. Vindrier
Window....E. A. Lewis
Window....A. C. Goddard
Window....J. C. Kimsey
Window cleaner, Car-....A. Mulligan
Window gravity-lock....A. C. Goddard
Wire-block guard....J. H. Reece
Wire-covering machine, Magnet-...A. Beutler
Wire fabric, 2 pats....O. R. Hunt
Wire fabric....W. W. Worcester
Wire-tie-twisting tool....J. P. Curry
Woodworking-machine....N. D. Cross
Work-recording appliance, Automatic....S. S. Berry
Wrench....T. S. Moffett
Wrench....J. C. Simpson
Wrench....R. W. Jones

DESIGNS.

Automobile-horn....L. Rubes
Badge....A. T. Fischer
Handkerchief or similar article...O. W. Wallis
Lamp-shade....D. C. Ripley
Padlock....J. R. Dean
Shoe-sole....F. R. McKenna
Spoon or fork....W. B. H. Dowse
Spoons, forks, or similar articles, Handle of....J. E. Birmingham
Stove....T. R. Kennedy et al
Vault-light....E. R. Jackson
Veil-pin, ribbon-pin, or similar article....Z. Freund

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MECHANICAL PATENTS.

Acid, Apparatus for making sulfuric....A. Gaillard
Adjustable hanger....O. L. Downing et al
Aerial ropeway....C. W. Henry
Air-brake system....H. W. Ley
Air-compressor, Variable-volume....M. Kurth
Air-heater....A. Mathis
Air-ship....W. Rumble
Alloy....J. F. Clapp
Amusement apparatus....E. Woerth
Amusement-slide....W. S. Tothill
Animal-trap....G. C. Biddle
Annunciator....E. J. Brandt
Arsenophenol....P. Ehrlich et al
Automobile-spring....L. S. Chadwick
Automobile steering-wheel....A. J. Kinnucan
Automoble wind-shield....H. H. White
Awl, Sewing-....A. M. Parker
Axle-oiling device....L. Damour
Bag....J. D. O'Brien
Baling-press....R. C. G. Neumann et al
Baling-press....W. O. Cumming
Balloon or air-ship....A. F. Godefroy
Barrel-trussing machine....T. A. Sullivan et al
Bath tub and cabinet, Combined....C. W. Peterson
Bath-tub waste and overflow connection....J. F. Eichenlaub
Battery-discharge regulator....E. J. Murphy
Battery-plate....G. B. Rinehart
Battery, Secondary....L. H. Flanders
Beating-engine....A. Muirhead
Bed, Spring-....W. E. Frank
Bed-spring....J. H. and L. S. Zeiders
Bedstead mattress or bottom attachment....S. W. Bennett
Beet-harvester....W. Kite
Beet-topper....S. R. Giddings et al
Belt-buckle....H. L. Perryman
Belt-carrier....C. Miller
Belt-coupling....J. C. Cottie
Bench-clamp....I. Solberg
Billiard-marker, &c....H. R. Wildish
Billiard-table....F. Hepton
Bin....J. Cameron et al
Binder or loose-sheet holder, Temporary....F. Pink et al
Block-signal system....F. B. Corey
Boat, Hydroplane-....L. E. Simpson
Boiler-lug....M. M. Hedges
Boiler-scale-removing apparatus....A. Schrör
Boiler-setting....D. F. Kilgour
Boiler stand, Range-....C. H. Foster
Bolt-clipper....H. K. Porter
Book, Instruction-....J. D. Thompson
Boot and shoe insole....G. W. Belonga
Boring apparatus, Deep-....W. Schott
Bottle, Non-refillable....S. Gardner
Bottle-washer....E. L. Arndt et al
Bottling-machine crown-branding attachment....F. M. Gilmore et al
Box-fastener....N. Dahl
Box-strap and bale-tie....A. A. Patzlaff
Brake-shoe....G. A. Woodman
Brake-shoe....H. Lewis
Brake-shoe....A. L. Streeter
Bridle-bit....J. Cummings
Brush....A. H. Wolcott
Brush, Rotary....H. Nielson
Bucket....H. Troegeler
Buckle....A. C. Stone
Buckle and clasp attaching means....H. Gibson
Burglar-alarm....H. Wettstein
Burglar-alarm....C. E. C. Edey
Butter compound, Making....J. E. Garrette
Butter, Making....C. G. Johnson
Button....E. R. Hoppler
Cable-hanger....C. L. Peirce, Jr.
Calculating device....S. R. Lamb
Calendar....W. H. Hall
Calendar frame and card....W. H. Hall
Can....C. Ruchti
Canning operations, Machine employed in....G. G. Glass
Car automatic air and gas valve....W. D. McPherson
Car brake-rigging, Railway-....W. H. Sauvage
Car center-bearing....L. W. Barber
Car constructor, Passenger-....F. M. Brinckerhoff
Car, Dumping-....S. Ketchum
Car-dumping apparatus, Mine-....E. B. Hubard et al
Car-end framing....A. E. Ostrander
Car-fender....J. D. Wright
Car friction draft-rigging, Railway-, 3 pats....J. F. O'Connor
Car, Grain-....G. R. Dunn
Car-jack, Suspension....A. O. Brill
Car, Passenger-....S. M. Curwen et al
Car-replacer....E. Babin
Car-seat....E. G. Budd et al
Car-step, Extension....E. W. Fuhr
Car, Two-way dump-....A. E. Ostrander
Car-underframe....W. P. Bettendorf
Cars to the floor-level, Automatic device for bringing hydraulic-elevator....I. B. Ritter
Carbureter....W. C. Westaway
Card holder, Illustrated-post-...E. O. Williams
Card-rack....E. O. Williams
Carpet-sweeper....O. R. Chaplin
Cart, Combination-....O. and M. Helgeson
Casing for light-fixture stems....P. J. Handel
Cash-register....H. S. Hallwood
Casks, Device for planing the rims of....L. Drexler
Caster....J. E. Johnson
Catamenial bandage....J. A. Treber et al
Cattle-stanchion....W. B. Crumb
Cellar-spray, Detachable....J. F. Oliver
Cement buildings, Waterproofing-paint for Portland-....T. A. Edison
Cement, Magnesia....C. Ellis
Cement structures, Waterproofing-paint for Portland-....T. A. Edison
Child's back-rest....L. F. Pullman
Chimney....M. E. Howe
Chimney-pot....T. B. Cullen
Christmas-tree holder....W. A. Mitchell
Chuck, Rivet-holding....D. C. Sasseman et al
Cigar-box....A. B. Smith
Cistern-cleaner and water-purifier....T. S. Murray et al
Clay, &c., Machinery for preparing or treating loam-....P. Baur
Clock....E. F. Herschede
Clock, Electric secondary....H. O. Jackson et al
Clock, Electric secondary....H. C. Vizents
Clock, Electric self-winding....H. O. Jackson et al
Clock-mount....H. J. Keating
Clock, Self-winding....C. W. Wagner
Clock system....E. E. Yaxley
Cloth, &c., Machine for cutting lengths of....F. W. Denison
Cloth or other material, Machine for trimming and cutting lengths of....F. W. Denison
Clothes-drier....G. N. Galloway
Clutch mechanism....J. Maitland
Cock for flushing-tanks, Ball-....W. H. Perkins
Cock, Stop-....A. D. Herschler
Cock, Three-way....E. H. Gold
Coffee-pot, China....C. F. Blanke
Coin-operated releasing mechanism....G. P. Brand
Coin-operating mechanism..E. F. Symonds et al
Collar dampening and burnishing machine....C. W. Currier et al
Color and making same, Sulfur, 2 pats....E. S. Chapin
Color and making same, Sulfur....E. T. Bundsman
Comb, Sanitary....H. T. Moler
Composition-board....J. Ferlà
Composition for antiseptic and other purposes..H. S. Blackmore
Composition of matter....J. Laeufer et al
Concrete metal reinforce....G. F. Dodge
Concrete-mixer....A. D. Hadsel
Concrete tie, Reinforced....W. Dunson
Condenser....G. M. Newhall
Condiment-holder....H. J. McWilliams
Conduit, Sectional....W. G. Wight
Conveyer....J. B. Denithorne
Conveyer-belt support....E. E. Vrooman
Cooking-utensil cover....C. J. Colling
Cooler....S. M. King
Coop or crate, 2 pats....O. J. La Bauve
Corn gatherer and husker....E. C. Dean
Corn separator, Seed-....C. F. Asplund
Cot, Collapsible....C. B. Lamb
Cotton-chopper....P. Harrison
Cotton-cleaner....A. L. Treese
Counting device....D. L. Roscoe
Cradle-crusher....R. K. Donald
Crane mechanism....D. Kendall
Crate or case, Shipping....J. M. Porter
Crown for winding-stems of watches....H. Axtell
Crusher....N. De Wind et al
Crutch, Adjustable....G. S. Rhodes
Crutch-tip....E. H. Seibert
Culinary utensil....H. B. Seely
Cultivator....O. Caron
Cultivator....W. J. Asbell
Cup-shaped articles, Apparatus for making....W. H. Smith
Cupola attachment....C. J. Langhorst
Current motor, Alternating-...M. C. A. Latour
Currycomb....J. Olsafskie
Curtain-fixture....P. A. Houghtaling
Cut-off....A. L. Rosene
Cutlery-grinder....H. E. Sweet
Cutter-bar....B. F. McElwee
Cutter-head....E. F. Beugler
Cycle-handle....W. C. Mead
Damper-regulator....W. M. Fulton
Dental implement....C. C. Murray
Dental stool or the like....W. H. Reynolds
Die-head, Automatic....F. L. Brown et al
Dish-washing machine....C. W. Jayeox
Display-rack....J. F. Riedy
Door-check....C. P. Dorn
Door construction, Sliding-....J. R. Hussey
Door-opener....F. Conner
Double rake....R. M. Kenney
Draft-equalizer....H. J. Heider. (Reissue.)
Dredging apparatus....J. Carlésimo
Drying....C. W. Volney
Drilling engine, Rock-....J. A. Traylor
Driving mechanism, Sliding friction....A. A. De Loach
Drum, Winding-....F. Donaldson
Dust-collector....H. A. Knos
Dye and making same, Anthacene..M. H. Isler
Dye and making same, Sulfur, 4 pats....E. S. Chapin
Electric alarm-bell....N. Kessler
Electric alarm, Thermo-....J. E. Paul et al
Electric fuse....L. W. Downes
Electric-machine brush-holder, Dynamo-....M. Walker
Electric machine, Dynamo-....B. A. Behrend
Electric machine, Dynamo-..M. W. W. Mackie
Electric machines, Means for starting dynamo-....W. D. Pomeroy
Electric signaling, Selective....A. H. Nicholson
Electric trap for rats, &c....J. T. Norris
Electrical driving mechanism....G. C. Marx
Electrical-impulse-transmitting device, 2 pats....J. Erickson
Electrode or pencil for arc-lights....I. Ladoff
Electrotype-plates, Bending....B. F. Upham
Elevator....W. Sherren et al
Elevator safety device....C. Paradis
Elevators and other movable objects and bodies, Appliance for....A. Lüngen
Embroidering-machine fabric-roller...A. Saurer
Engine admission-valve, Gas-....G. B. Petsche
Engine bed-plate, Beater-....R. A. North
Engine-starting apparatus, Explosive-....L. M. Booth
Engine valve-gear....C. F. Prescott
Engine valve-gear, Steam-....A. Hossfeld
Ether, Santalol....J. Callsen
Excavator....W. S. Smith
Exchange switching device, Party-line-....W. Hagstrom
Extension-bolt....C. T. Schwing
Eyeglass-case....A. W. Farrington
Fabric....N. L. Duryea
Fare-register....J. Linhardt
Feed-mill....R. S. Tomkinson
Feeding device for machine-tools, &c....C. A. Hirth
Fibers and fabrics, Waterproofing....T. A. Edison
Fibers, Treating vegetable textile....A. E. M. Rousseau
Fibrous materials, Securing together surfaces of....J. R. Harbeck
Fifth-wheel....R. G. and L. Cator
File case or cabinet....E. G. Minder
Filing-case....C. P. Zoerb
Film-roll holder, Adjustable....W. J. Bresnan
Firearm with cylindrical breech, Semi-automatic....B. Goebel
Firearms, Breech mechanism for self-loading....L. Schmeisser
Fish-hook holder, Snelled-....C. F. West
Flier....W. Knowles
Floor-scraping machine....G. S. Newman
Floor-scraper....J. L. Hearing
Flooring-clamp....A. A. Hendrickson
Flower-pot....E. Bade
Flush-tank....J. O. Brousseau
Flushing-tank....H. S. Hawks
Folding box or crate....H. L. Gulline
Fruit, Apparatus for use in the treatment of....J. C. L. Campbell
Fruit-cutter....A. J. Brunson
Fruit-sorter....A. D. Huntley
Fruit, Treating....J. C. L. Campbell
Fruits or vegetables, Preserving....A. Huch
Fuel, Artificial....J. W. Leadbeater
Furnace....G. Prescott
Furnace....A. Wardzinski
Furnace....W. T. Dodge
Furnace....D. M. Jackson et al
Furniture, Folding....W. Rabich
Furniture, Hollow sheet-metal....F. B. Burns
Furniture-joint for wooden structures....A. N. Webb
Furniture-structure lock-clamp, Knockdown-....W. C. Doleater
Fuse and fuse-block, Portable....G. A. Drueker
Game apparatus....J. Baust
Game apparatus....D. H. Talbert
Game apparatus....W. L. Fross
Gas-burner....A. F. Thompson
Gas-burner, Safety....J. H. Ahlgren
Gas generator, Acetylene-....W. E. Shreffler
Gas-heater automatic cut-off....H. A. Koenig
Gas-meter-connecting device...H. F. Gray et al
Gas-producer....C. L. Straub
Gas-producer....P. G. Schmidt
Gate....I. Lester
Gear-tooth-chamfering apparatus....R. B. Weaver
Gears, &c., upon shafts, Machine for removing from and replacing....C. Remelius
Glassware, Making machine-footed....J. I. Arbogast
Grain-drill....A. Bellerive
Graining compound....F. M. Clapp
Grate....D. W. Cherry
Grinder....H. G. McCulloch
Guide for heming....B. and G. Branower
Gun, Automatic....A. T. Dawson et al
Gunpowder, Smokeless....C. P. H. Claessen
Hand-bag....A. Staeger
Hank-dyeing machine....J. H. Ashwell
Hay-carrier....F. S. Polley
Hay-sling lock....A. P. Boyer
Heating-furnace, Hot-air....D. S. Richardson
Heating system, Vapor....J. D. Arnold
Hinge, Detachable....J. F. Melton
Hog-ring....R. Roethlisberger
Hook and eye....W. M. Corthell
Horse and cattle water-bowl, Automatic....P. A. Cheevers
Horse-detacher....M. S. January
Horseshoe-pad....J. Dillon

Hose-coupling....J. J. Antic
Hose-coupling....B. Morgan
Hose-supporter....H. W. Richardson
Hydrocarbon-burner....P. M. Keller
Hydrocarbon-motor....E. E. Winkley et al
Hydrogen, Composition of matter for generating....G. F. Brindley
Ice-cream mold....T. Cohn
Ingot, &c., casting apparatus....W. J. Evans
Ingots, Solidifying....E. P. Cuinat
Inkstand....W. H. Wetmore
Insulated rail-joint....E. F. Schermerhorn
Insulators, Screw-press to form....R. G. Hemingray et al
Internal-combustion engine....F. W. Brady
Internal-combustion engine..C. R. Daellenbach
Jack....J. W. Carlson
Ketone sulfoxylate and making same....A. Stock
Knife-handle-polishing machine...W. J. Carney
Knitting-machine thread-controlled stop-motion, Circular....N. H. Williams
Knotting mechanism....L. B. Wygant
Ladder....H. A. Myers
Ladder, Step....C. J. Reed et al
Ladder, Step....J. B. Robertson
Ladle crane mechanism....D. Kendall
Ladle, Swinging....W. R. Palmer
Lamp....A. W. Hall
Lamp, Incandescent, 2 pats....M. M. Merritt
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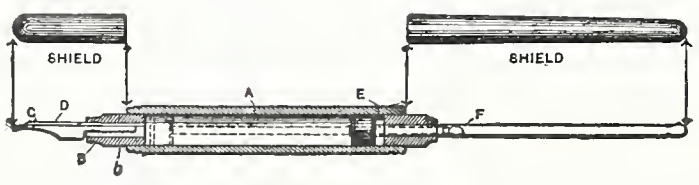
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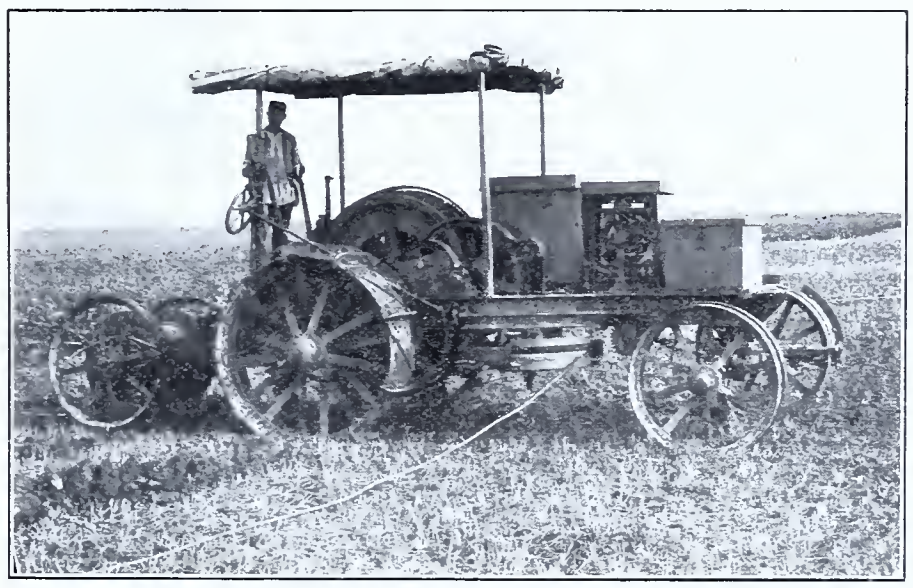
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APPLICATIONS OF ELECTRICITY TO AGRICULTURAL OPERATIONS.

By C. VANLANGENDONCK.

FOR years, efforts have been made to substitute mechanical means for animal power in agriculture. This meant, however, complication in the operation of farm machinery, on account of the introduction of long shafts, belts, and other apparatus of transmission, and another great disadvantage lay in the fact that such power could be profitably utilized over a very restricted territory, usually at the point where the prime motor was installed. It was therefore practically impossible to utilize mechanical energy in the field for plowing, sowing, etc., as these require too flexible a system for distribution. Another serious drawback was the heavy weight of the machinery, making it difficult to transport it over hilly country and soft land. On the other hand the benefits from the use of the electric power are apparent at once, as on account of the flexibility of the system, current may be easily distributed over large tracts of land, and feeders strung over the entire farm. The energy at any point may be readily converted into light, heat, or power, it being easy to transport a light electric motor.

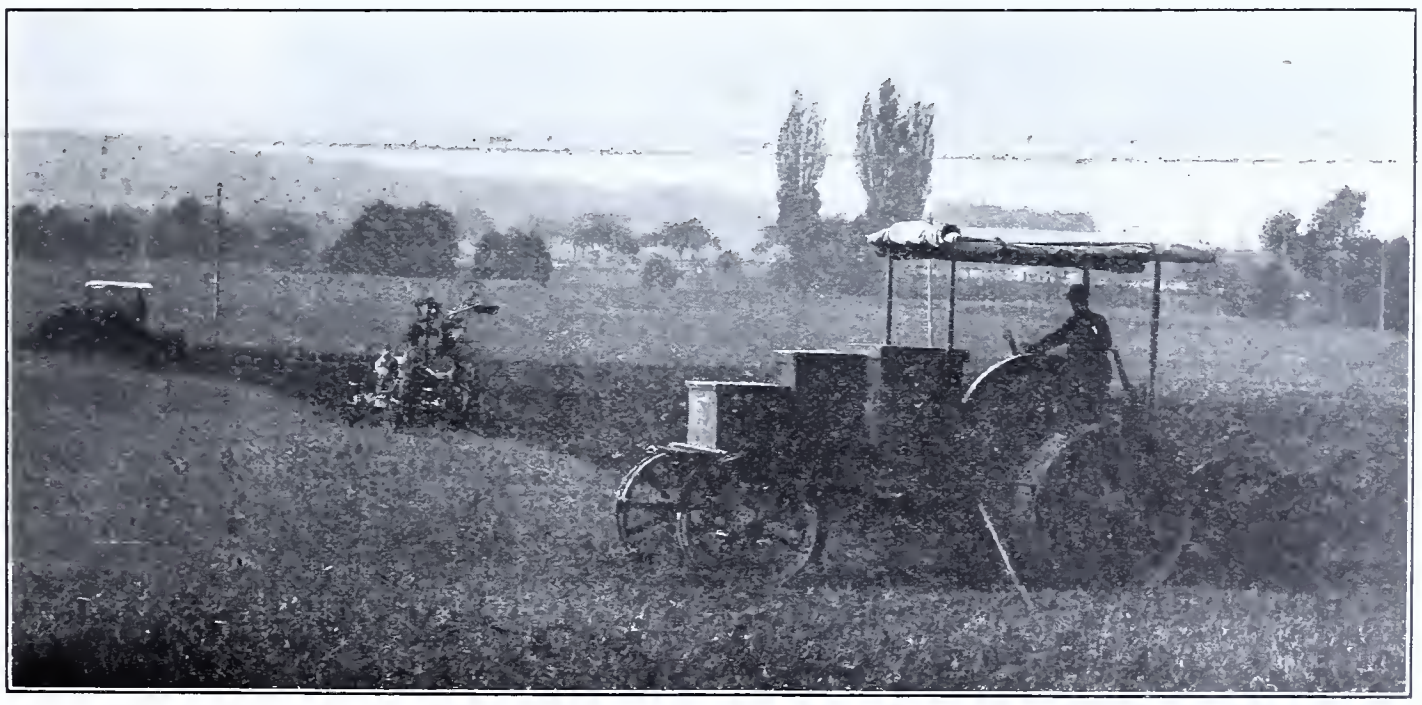
Judiciously employed, electricity would work a practical revolution in agriculture. There is no lack of the requisite sources of energy for the generation of electricity. The wind may be made to drive dynamos charging reserve accumulators for use when the weather is calm; waterfalls are being turned to account far and wide. Then there are steam engines already in use in agricultural districts; and in connection with other industries more or less related to agriculture, oil motors, spirit motors, etc. Where the size of the farm does not justify the installation of a private plant or even the purchase of an electric motor, a central station could be erected, having a department for the renting of semi-portable motors to be used for farming purposes. Or one farmer might buy a motor and when not using it himself, rent it to his neighbor.



MOTOR STATIONED AT ONE END OF THE FIELD SHOWING CABLE AND WINDLASS.

Electricity can be used for many purposes in agriculture, but preeminently for cultivation. In the opinion of investigators who have made a special study of this subject, the new science of electroculture affords a vast field for progress. Some believe that the effect of light on plants is due to simple electric phenomena and that consequently light can be replaced by electricity—though an effective method of application has still to be discovered. Further, it has been found that by electrifying seeds, their germination is notably accelerated. For instance, some peas treated by electricity germinated in two and a half days, instead of in four, beans in three days instead of in five, etc. Electricity decomposes the salts contained in the soil and forms others which can be more easily assimilated by the plants. It increases vitality and thus favors the exchange of gases between the leaves and the atmosphere, promotes respiration, the fixing of carbon, and the nutrition and multiplication of the cells. It influences the circulation of the sap, and thus forces the nutritive juices into the capillary vessels in the tissues of the leaf.

For several years, the application of electricity to agriculture has been growing on the continent of Europe, especially in Germany, where the proprietors of large farms have realized the advantages of this system.



ELECTRIC PLOW IN OPERATION SHOWING MOTORS AT OPPOSITE ENDS OF THE FIELD.

In the field, the electric plow gives excellent results. These plows are generally of two types, one having a single and the other a double motor. The single motor plow has usually two series of 3, 4, 5, or 6 shares. One series serves for the outward journey, and the other for the return. Either the one or the other set is put into action by drawing the plow backwards

and forward between two points. The plow then travels from one side of the field to the other, or to put it more exactly, from the windlass to the point of support, by means of wire cable. The motive truck carries one or two drums driven by an electromotor. The point of support is formed by means of a truck fitted with cramp irons. The two trucks move automatically at each furrow, the extent of their movement varying according to the width of the furrow desired. The double motor system differs from the single one, merely in that the cramp-iron truck is replaced by a second motor truck. The first system is more suitable for work of slight depth in light soil, the second for depths of from 1 ft. to 1 ft. 4 inches and more, in compact ground. These machine plows are constructed for a tractive effort of 4,400 pounds, and for working speeds of 3 to 6 feet per second. They are fitted with electromotors of from 40 to 60 horsepower, according to the speeds for which they are required. With one of these electric installations, 3 or 4 acres are easily treated in a working day of 10 hours, the depth of the furrows being from 9 inches to 1 ft. 1½ inches. Although electric plowing ensures considerable saving compared with plowing by animal traction, it requires the investment of large capital. The total cost of an equipment similar to those described is from $1,500 to $10,000, so that it has not much of a future before it as regards small farms.

On large estates, however, as soon as the crops have ripened, threshing machines, etc. come into use. All these require motive power, and this can be obtained more cheaply, more conveniently, more easily and with less danger from electric motors than from any other type of machine. However, to make them doubly valuable, it should be possible to transport them with ease into the vicinity of the machines they are to operate.

To this end they are permanently fixed upon a wooden base, if they are of a small size, or upon a wagon if they are too large to be carried by men. When made in this way, one or two motors will suffice to deal with work upon a large scale, provided, of course, that they are kept continually at work, one machine being driven when the other is not in use.

All agricultural and dairy machines are adapted to be driven by electricity. Among others we may mention threshing machines, chaff cutters, carrot and beetrootcutters, winnowers, centrifugal cream separators, pumps of all kinds, oil cake crushers, mills of all types, elevators, sheep-shearing machines, churns, fans, grindstones, etc. The cuts show electric plowing.

Certain machines, such as threshers, require the output of a 5 to 20 horsepower motor; others of smaller size take only from 1 to 3 horsepower, and in this case three or four can be driven by the same motor, by the use of a countershaft. Electric motors can even be turned to account in the household, where they are to be found driving coffee mills, sewing machines, heating flat irons, etc.

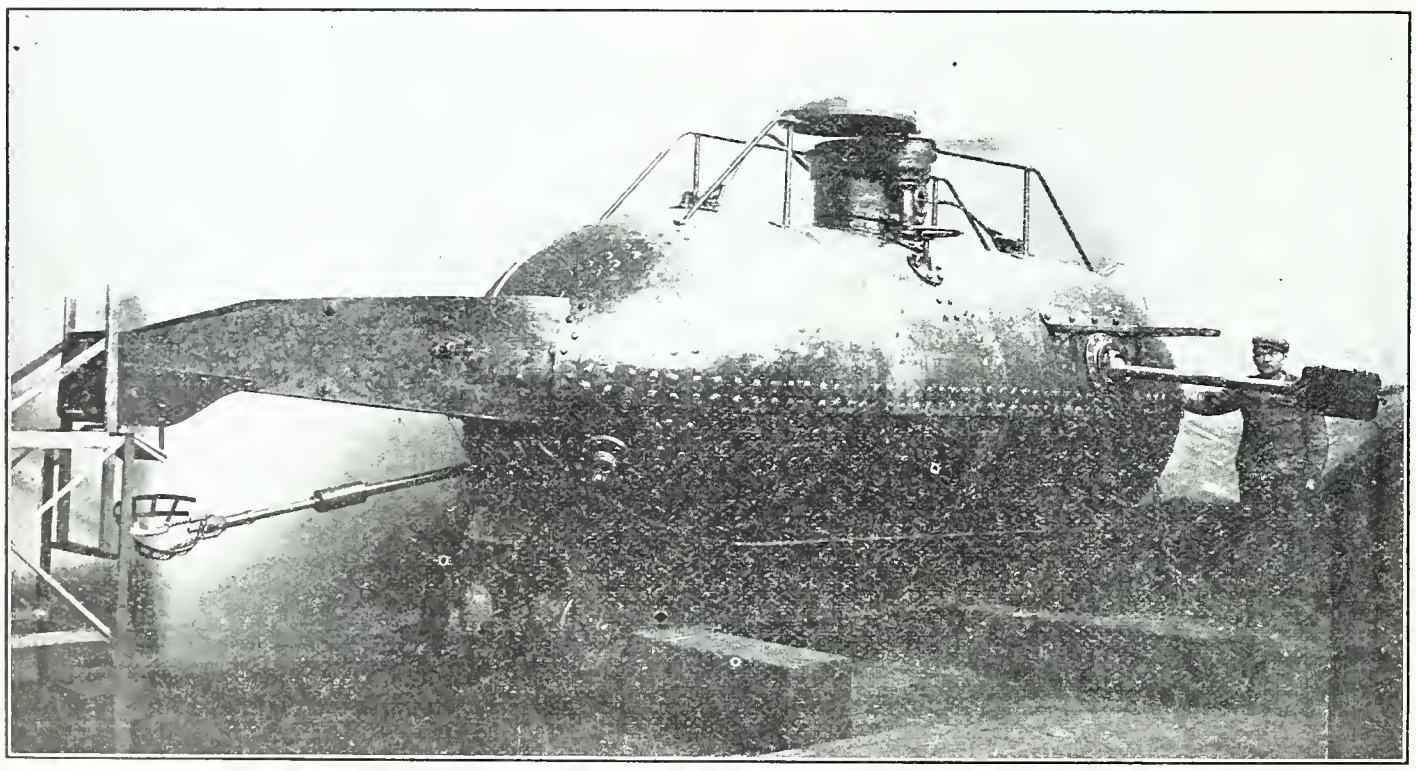
In conclusion, it must not be forgotten that a great advantage is to be derived from using electric light on farms, because it not only obviates all risks from fire—provided the wiring has been properly laid—but it also enables work to be undertaken in the open air, a matter of vital importance when climatic conditions dictate a continuance without delay of any kind.

SUBMARINE FOR SPONGE FISHING.

By C. VANLANGENDONCK.

Although modern equipments are used to some extent in sponge fisheries, most of the work is still performed by nude divers who, weighted with large stones which they leave at the bottom, descend to considerable depths in search of the valuable zoophytes, to the great injury of their general health and especially of their lungs.

It is expected, however, that in the near future this industry will undergo a complete revolution, through the introduction of a curious type of submarine. The experimental boat now in use on the coast of Tunis, in the neighborhood of the harbor of Sfax, has a length of 16 feet, a diameter of 5 feet, a displacement in salt water of 1941 pounds, and a floating capacity of 1344 pounds. It is a cylindrical machine with rounded ends, surmounted by a kiosk, which affords a means of access to the interior of the submarine, a suitable device being provided for opening and for closing the entrance hermetically. This, in ordinary weather, can be operated both from the inside and the outside. The boat has two water tight compartments, which have a capacity of 56 gallons each, and are filled by means of pipes running direct to the sea; they are emptied by the aid of a hand pump placed in a suitable position. A third waterballast, holding 14 gallons only, is placed in the center. It receives water direct from the sea, and can be emptied by means of compressed air from the compressed air tank. This is used, in normal weather, for submerging and raising the submarine. Underneath the vessel there is a lead weight, weighing ¾ tons, which can be released from the inside, causing the vessel to rise rapidly to the surface in case of danger. There is also a sounding plumb line, weighing 50 pounds, and operated from the inside, for producing vertical displacement, etc.



NEW TYPE OF SUBMARINE FOR SPONGE FISHING.

On reaching the bottom, the submarine rolls along upon a suitable wheel placed at one of its ends, the necessary movement being obtained by the action of two oars worked from the interior. These oars are formed of rods having spherical joints at the points where they enter the boat, the blade consisting of a steel frame provided with two hinged floats which can open only in one direction, so that when moved backwards and forwards the blade offers a resistance by bearing against the water on one side, while, on the other side, the two floats turn on their hinges and allow the water to pass.

Sponge fishing is carried on by means of a long pair of pincers, projecting from the front of the boat and operated from the interior. The pincers can be turned in all directions and can rotate on their own axis. Just above the point where the pincers emerge there is a post hole covered with strong glass, through which the light obtained from four electric lamps of 10 candle-power each is projected, so as to light up the water and the ocean bed for several yards around. Those inside the boat can communicate with the surface by means of a telephone and speaking tube. The submarine was tested in Toulon harbor; it plunged to a depth of fifty fathoms, performed its duties without a hitch, and reached the surface unscathed in any way. The boat has been constructed by the Forges de la Mediterranee, at La Seyne.

A Japanese Typewriter.

The Japanese is a singular and, in someways, a very difficult language. It is based on some thousands of ideographs or idea-pictures, derived from the Chinese; but in order to translate these ideographs into the vernacular, two systems of phonetic writing are in use, one called the Katakana and the other the Hirogana. The former, says the *Pathfinder*, is the more generally used by the Japanese, and in undertaking the difficult task of making a Japanese typewriter, the Remington Company has adopted this system. As Japanese writing is written in vertical columns and reads from right to left, it was necessary to reverse the mecbanism of the ordinary typewriter to make it write "frontwards" according to Japanese ideas. The typewriter as adapted to the Japanese language could not of course carry the several thousand ideographic signs, but the Katakana phonetic system is perfectly legible, it being the one that is employed for sending telegrams in Japan. There are movements looking to the simplification of Japanese writing, but they have not yet made much progress.

Photographing the Growth of Flowers.

It is interesting to note that the moving picture camera can reproduce not only swift motions, but slow as well. It is now possible to show a flower in its various processes of growth, and in the transition from blossom into fruit. It may take months to secure the negatives of this process, but the result consumes only five minutes when thrown upon the screen. When the bud of a rose begins to show, a film is exposed, and is replaced by a fresh one every ten minutes day and night (by the use of an arc light) until the flower has fully unfolded. About 2400 films are employed in the process. A very pretty effect is gained in depicting the emergence of a butterfly from its chrysalis. When a movement indicates that the insect is about to break through its shell, the films are run off rapidly, and the final negatives show the butterfly floating away into the sky until it passes out of sight.

WILL HARNESS THE OCEAN'S WAVES.

By CHARLES ALMA BYERS.

THE mighty power of the ocean has at last been yoked and made to serve mankind. Numerous efforts to accomplish this feat have been made in the past, but success has been evasive; most of these attempts having resulted in failure, with now and then just a shadow of encouragement to "keep trying." It is, however, a matter of history that the American inventor seldom undertakes anything that he does not ultimately perfect; and this seems to be true in the harnessing of the ocean's waves.

At Redondo Beach, Cal., a few miles from Los Angeles, the Los Angeles Wave Power and Electric Company has nearly completed a $50,000 plant whose power will be derived entirely from the waves of the ocean. Construction has already progressed to the stage where tests of working ability can be made, and those that have been made during the past few weeks have seemed to demonstrate beyond doubt that the undertaking will be a success. The plant is calculated to develop 200 horsepower, which is to be utilized for electric lighting and motive or other industrial power, and is designed to be the first unit of a $50,000 horsepower plant.

The plans and patents from which the plant is built are the work of Fred Starr of San Francisco and Los Angeles, who has been working on his invention for about fifteen years. The principal features of the plant, briefly described, are a pier built into the ocean, a barge in the water beneath the pier, power shafts on the pier, and a combination of clutches so connected to the power shafts and to the barge that when the barge is moved by the waves, either upward or downward, the power shafts revolve in one direction. The machine is constructed so that it works perfectly at all stages of the tide, and on both large and small waves.

The barge, or float, (Fig. 1.) upon which the waves will exert their power directly, is 92 feet long, 24 feet wide and 8 feet deep. It is constructed with air-tight chambers, and so regulated that some of these chambers can be permitted to fill with water. This is for the purpose of lessening the buoyancy of the barge; and for emergencies it can be submerged entirely, thereby permitting the waves, during high and rough seas, to pass over it and prevent damage. It is so anchored, independently of the pier, that it may move in any direction with the waves, tides and undertow. It is tethered by 28 tons of anchorage, and will operate 345 tons of machinery. The anchor and chains alone weigh 37,000 pounds.

This, briefly, is the cork upon which the ocean will operate to "give its every ripple and singing billow a commercial value." To each corner of this barge is attached a piston rod, which has direct connection in the powerhouse above with the wave motor machinery. Every motion of the barge is conveyed, by means of the piston rods in conjunction with friction clutches and cables, to the air compressors. The clutch is so designed that when the barge is moved either upward or downward, the power shafts revolve in one direction.

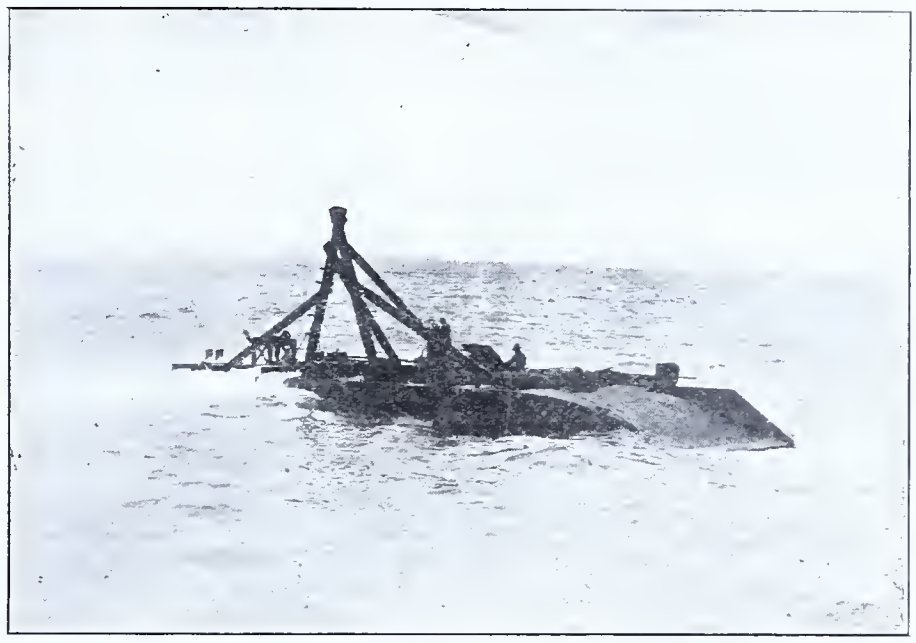


FIG. 1.—SHOWING THE BARGE, OR FLOAT.

The powerhouse is equipped with light air compressors, which, in response to the motion of the barge, as conveyed to the piston rods, friction clutches and cables, force the air into two immense tanks. The movement of the waves being irregular, compressed air is utilized in order to secure a steady, regular power. The compressed air is conveyed from the tanks through electric heaters and heated to from 250 to 300 degrees Fahrenheit, and then introduced into the engines. The object of this is to gain from 40 to 50 per cent through the expansive power of the heated air.

The engines are run by the compressed air, condensed by the wave motor, and these engines operate electric generators. At present the pier, which is 200 feet long, is illuminated by these generators, and it is claimed by the builders of the plant that the energy can be carried anywhere within a radius of 300 miles, and at a rate much less than that created by other means.

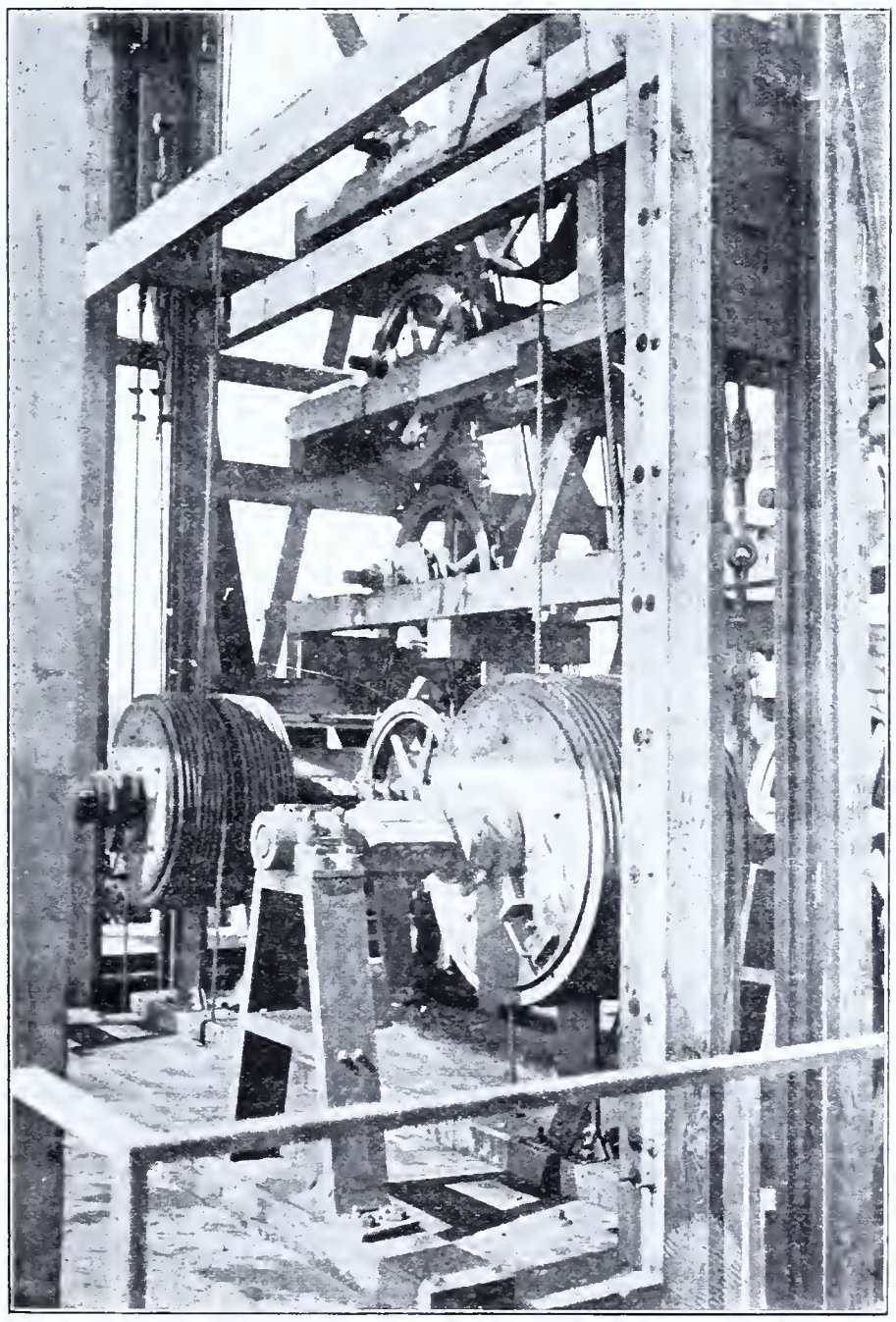


FIG. 2.—SHOWING THE FRICTION CLUTCHES.

The friction clutches, (Fig. 2) of which there are eight, constitute, says Mr. Starr, the cardinal principle upon which the success of the invention rests; and upon their perfection, so that they would take power from both the upward and the downward movement of the barge, the inventor spent much time and study. They are four feet in diameter, and are keyed to the power shafts. Around the friction clutches are wrapped cables, and they are arranged in pairs, one pair being operated by the piston rod from each corner of the barge. The outer surfaces of the clutches are grooved to accommodate the cables, which are wrapped in inverse order so that as the barge ascends it revolves one clutch forward at each corner of the barge and one backward, the one going forward revolving the power shaft and the one going backward being out of gear and doing nothing. As the barge descends it performs the same operation. In this manner the power shaft is given continuous revolutions forward, or in one direction, by either the upward or downward movement of the waves.

The amount of power produced is dependent upon the buoyancy of the barge in going up and its weight in going down. It is estimated that the wave force at a most quiet period of the ocean will be one horsepower a minute for each ton in weight of the float. The weight of the float can be regulated, by means of its chambers, to suit the strength of the waves.

The possibilities of a wave motor that will operate successfully—and this one promises to do so—are many. It will mean, at least, much cheaper power for all coast towns than is obtainable at the present time.

The Ocean Express of the Future.

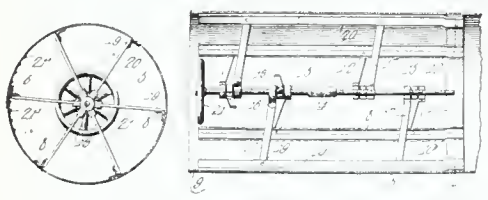
The price in power paid for present-day speeds in ocean vessels is tremendous. The Kaiser Wilhelm II requires 40,000 horsepower to attain a speed of 23 knots, which is five times that required by the Great Eastern to make 14 knots. The Lusitania requires 30,000 horsepower more than the Kaiser Wilhelm II to obtain an increase of only 1½ knots per hour. Any considerable increase in speed is therefore seen to be impossible along the present lines. While power plants and propelling machinery have been greatly improved during the last forty years, the style of hull remains the same, and it is in this direction, says an Edinburg writer, James Dickie, that radical changes must be made in order to attain speeds of 30 to 35 knots, which the demand for quick transatlantic passenger service makes desirable. He suggests a new type of vessel, which has for its object the avoidance of undue head resistance, also of eddy-making at the stern, by the adoption of narrow hulls, stability being obtained by bracing several of such hulls together, with water spaces or channels between and a superstructure over all. The propelling power, instead of being placed disadvantageously at the stern, is distributed along the entire length of the ship by many high speed turbine-driven propellers of moderate size.

CLEVER NEW PATENTS.

Mold or Centering Device.—Rotary Churn. Horse Collar.—Truss.

Mold or Centering Device.

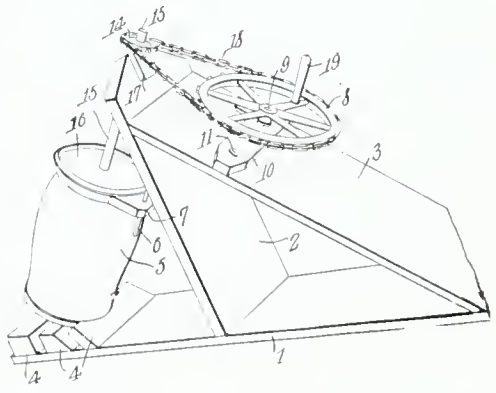
Among recent inventions of interest is a mold, of the class designed for use in the construction of culverts, arches, drains, sewers and similar hollow structures. It is credited to John Edward Dooley, of Fond du Lac, Wisc., and it is capable of being quickly set up for use and of being readily adjusted to permit the formation of culverts of different sizes and shapes. The cylindrical body portion (see cut) of the mold is preferably in the form of a longitudinally split shell, the adjacent ends of which are overlapped to allow for expansion and contraction of the shell when constructing culverts of different cross sections. The interior walls are strengthened by a number of spaced bars 8, preferably in the form of angle irons, each having one terminal spaced from the adjacent end of the shell to produce a smooth inner surface extending round the entire circumference of the shell. The opposite ends of the angle bars are offset and extended beyond the adjacent end of the shell to support a terminal coupling collar or sleeve 11, interposed between the offset of the bars and the inner walls of the shell, said collar being rigidly secured to the shell and split transversely so as to permit expansion or contraction with the shell. Within the shell are longitudinal rod sections, united by a suitable coupling and provided with right and left hand threads. Correspondingly threaded collars 15 are slidably mounted on the rod sections and



are provided with lateral ears 16. The collars are operatively connected with the shell by means of radiating arms 17, one end of each of which is pivoted to the ear 16, and the other end to the lateral flange of the angle bars. The outer end of the rod section 13 is provided with a hand wheel 21, so that by rotating the wheel the arms 17 may be actuated to cause expansion or contraction of the shell. The overlapped ends of the yieldable shell are locked in adjusted position by means of interlocking teeth. It will be seen that the arms support the shell in an extended position so as to prevent it from collapsing by the weight of the cement when forming a culvert or sewer, the inclined walls of the teeth permitting the same to slide over each other when the wheel is actuated to contract the shell, to permit the removal of the latter from the molded structure. In operation, the teeth are disengaged and the shell expanded to produce a centering device of the desired diameter, after which the wheel is operated to further expand the shell, which causes the teeth to interengage and thus lock the shell in adjusted position. A mating shell is then placed in position on the collar, and the cement or concrete positioned around the shell and troweled off in the usual manner. When it has thoroughly set, the mold is withdrawn from the culvert by turning the wheel in the opposite direction, which causes the arms to contract the shell, so as to permit its removal from the molded structure.

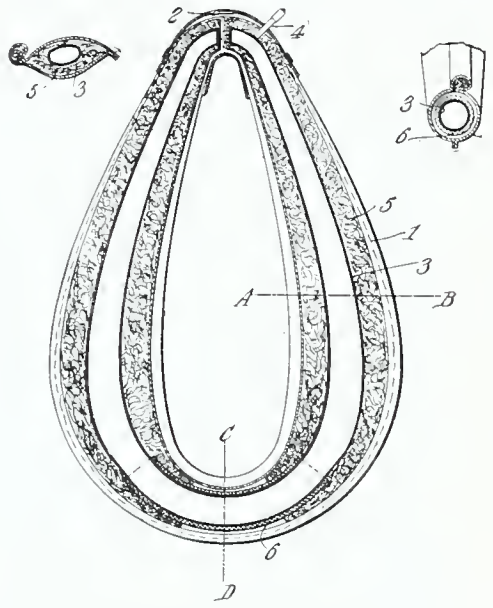
Rotary Churn.

Farmers' wives will welcome a churn that can be readily operated from a sitting or standing position. A rotary device of this character, invented by Stansbury Jacob Smith, of Hot Springs, Ark., constructs the support for the churn so that it can be adjusted to various sizes of tubs, and also provides a novel method for detaching the actuating mechanism, in order to remove the churn from the support. As shown in the cut, the churn is supported in an inclined position, and the mechanism supported so as to form the side of a triangle with the plane of the churn, thus permitting it to be operated with much less fatigue than if the mechanism lay in a vertical plane, which would involve the tiresome bending motion. The standard 2 is rigidly supported by the strut 3, and chocks 4 support the lower end of the churn, the inner one being concaved. Guide bars 6 attached to the standard form a support for the bracket 7, the upper end of which is provided with a concave surface lying in an inclined plane with the inner chock, so that when the lower end of the churn is tilted and brought to bear on the concave surface of the inner chock, its opposite end will be engaged by the concave surface of the bracket. Thus it will be seen that the working position of the churn will be inclined, it being designed to have such incline extend beyond the vertical center of the churn, so that the latter's weight will hold it in place. The actuating mechanism consists of a sprocket wheel 8 rotatably mounted on a shaft 9, secured to a block 10, which is pivoted to the upper face of the strut. The sprocket wheel is in direct alinement to the pinion 14, adjacent the upper end of the dasher shaft, and this upper portion enters a socket 17 in the standard 2. A suitable sprocket chain connects the pinion with the hand wheel, and the latter is turned by a handle. The churn, when desired, can be made to assume a vertical position by moving the the block upward on its pivot, so that the chain can be detached from the pinion.



Horse Collar.

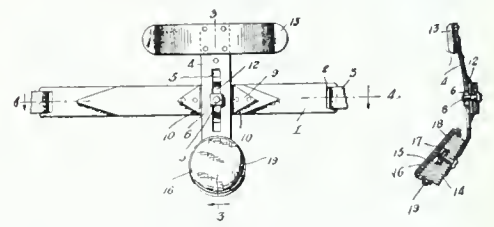
A pneumatic collar for horses is among recent novelties, the lightness of the device especially recommending it, as well as its efficiency and durability. The air container is so protected from the action of sweat that it is prevented from rotting, and is thus



rendered more lasting than air containers heretofore employed. The collar casing is formed of leather in the usual manner, and has an inflatable core 3, preferably of elastic rubber, said core consisting of a tube, the ends of which are closed and seated within the ends of the casing. Each side portion of the casing has a lining of felt or some such material, which prevents moisture absorbed by the leather casing from coming into contact with the core and rotting it. These linings, which are designed to pack the casing, do not surround the lower portion of the core, as this would interfere with the flexibility of the collar. Extending into the ends of the linings, at opposite sides of the center of the collar, are the terminals of a flexible protecting tube 6, of canvas or other durable material, through which the core extends. When it is desired to use the collar, the core is inflated by attaching a pump to the tube 4, designed for this purpose. The collar being expanded will rest easily upon the neck of the animal, and any perspiration absorbed by the casing will be prevented by the lining from reaching the core. Since the tube 6 does not come into contact with the casing 1, the middle portion of the tube 3 will likewise be protected from the moisture. Should the tube 3 be deflated from any cause, the collar can still be used because of the stiffness imparted thereto by the linings. The invention is due to Ora W. Walters, of Bloomington, Ill.

Truss.

An improved construction of truss, recently invented by John H. Windisch, of Toledo, Ohio, does away with the necessity of employing the usual supporting harness. A main supporting bar, 1, is provided, which is formed of spring metal and may be in the form of leaves, which increases its resilient quality. In each end is a slot for the ends of the supporting belt, and on the inner side of the bar, to one side of the center, is a vertically disposed cross bar, 4, with a slot in which is a fastening nut 6. A clamping screw 8 engages this nut and so adjustably secures the cross bar to the main supporting bar, guide plates 9 preventing the cross bar from turning thereon. A spring metal plate, 12, braces the bar 4 when the truss is arranged in position on the body of the wearer, and secured to the upper end of this bar is a body engaging plate 13, curved to fit the body; and on the lower end—which is bent inwardly—is revolubly mounted a pad block, 14, which may be of any preferred form or material, but is here shown of wood, and circular. This pad block is beveled so that one side is thicker than the opposite one, the object being to bring a varying pressure upon the rupture, when the block is turned.



Removably secured to the block is a pad formed of a plurality of layers of cloth or other suitable material, held in place by a clamping ring. It will be seen that this truss may be supported in position without the necessity of using the customary shoulder straps and supporting harness, and also that it is entirely sanitary, as the pad may be removed and renewed as often as desired. The arrangement of the cross bar 4, on which the pad is secured, to one side of the center of the main supporting bar, enables the pad to be engaged with a rupture on either side.

PATENTS

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LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

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CALIGA v. INTER OCEAN NEWSPAPER COMPANY.

(Circuit Court of Appeals, Seventh Circuit. October 1, 1907. 157 F. R. p. 186.)

1. COPYRIGHTS—INFRINGEMENT-ACTION FOR STATUTORY PENALTY.

Strict construction and proof are required in an action under Rev. St. § 4965 [U. S. Comp. St. 1901, p. 3414], to recover the penalty thereby authorized for infringement of a copyright.

2. SAME — COMMON LAW AND STATUTORY COPYRIGHT.

The common law gives the author of a painting the exclusive right to reproduce the same so long as he does not make publication, but on publication such right is lost, and he can only acquire the right to further protection by a statutory copyright.

3. SAME-VALIDITY-DOUBLE COPYRIGHTING.

Bnt a single valid copyright can be obtained upon the same subject-matter; and an artist by depositing the name and description of a painting in the prescribed office did not acquire a copyright thereon, where he had previously deposited a photograph of the same painting under a different name and description for the pnrpose of obtaining a copyright, unless it is shown by proof that such prior deposit was inoperative.

KUHN et al. v. LOCK STUB CHECK CO.

(Circuit Court, S. D. New York. Nov. 11, 1907. 157 F. R. p. 235.)

PATENTS—INVENTION — TYPE BLOCK—ENLARGEMENT IN DEGREE.

The Force patent, No. 705,228, for a handle for a type block, consisting of a metallic handle with two flanges at the lower end having gripping edges, between which is held a rubber type block, the claimed invention being in the use of the flanges, instead of glue or cement ,to fasten the rubber block to the handle, is void on its face for lack of invention.

EMPIRE CREAM SEPARATOR CO. et al. v. SEARS, ROEBUCK & CO.

(Circnit Court, S. D. New York. Nov. 21, 1907. 157 F. R. p. 238.)

1. PATENTS—INFRINGEMENT— CREAM SEPARATORS.

The Anderson patent, No. 555,893, for a centrifugal apparatus for cream separators, was not anticipated, and, in view of the conceded usefulness of the device and its commercial success, must be conceded invention; also held infringed.

2. SAME—SUIT FOR INFRINGEMENT-LACHES.

Acquiescence in infringement may debar the owner of a patent from the right to a preliminary injunction, but will not prevent the granting on final hearing of such relief as may be equitable.

3. SAME—VALIDITY— DEFECTIVE APPLICATION.

A patent will not be declared invalid by a court because the venue of the affidavit to the application was laid in one state and the jurat was made by a notary in another, where such application was accepted by the Patent Office and no fraud is shown.

EARLL v. ROCHESTER, S. & E. R. CO.

(Circuit Court, N. D. New York. Nov. 25, 1907. 157 F. R. p. 241.)

1. PATENTS—SUIT FOR INFRINGEMENT—PRELIMINARY INJUNCTION.

A preliminary injnnction against infringement of a patent will usually be denied, where its validity is denied and has not been established by prior adjudication or by long acquiescence.

2. SAME— PRIOR ADJUDICATION—CONSENT DECREE.

A decree adjudging the validity and infringement of a patent signed by the judge without a hearing or reading of the evidence, by consent of the parties, is not such an adjudication as constitutes a proper foundation for the granting of a preliminary injunction in a suit against a different defendant.

NATIONAL CASKET CO. v. STOLTS.

(Circuit Court of Appeals, Second Circuit. Nov. 7, 1907. 157 F. R. p. 392.)

PATENTS—PRIOR USE— FACE PLATES FOR BURIAL CASKETS.

The Hamilton patent, No. 619,567, for a face plate for burial caskets, consisting of "a stretched sheet of transparent nonbrittle gauze fabric," held void for prior use on evidence establishing beyond reasonable doubt that such face plates of cotton and silk illusion had in numerous instances been used many years before the application for the patent was filed.

HILDRETH v. CURTIS & SON CO.

(Circuit Court, D. Maine. December 7, 1907. 157 F. R. p. 394.)

PATENTS—SUIT FOR INFRINGEMENT—PROCEEDINGS IN PATENT OFFICE AS ESTOPPEL.

Proceedings in the Patent Office, even when a direct issue is made and passed on, operate as an estoppel in subsequent litigation in the courts only to a very limited extent, and can have no effect as an estoppel, even on a motion for a preliminary injunction, as against one who was not a formal party thereto. Prindle v. Brown (C. C. A.) 155 Fed. 531, applied.

EISEMAN et al. v. SCHIFFER et al.

(Circuit Court, S. D. New York. Aug. 28, 1907. 157 F. R. p. 473.)

1. TRADE-MARKS AND TRADE-NAMES-VALIDITY OF TRADE-MARK FOR SILK GOODS—"RADIUM."

The word "radium" is not descriptive as applied to silk, and its exclusive use by a manufacturer as a trade-mark on pieces of taffeta silk having a special soft finish, and its registry under Act Feb. 20, 1905, c. 592, 33 Stat. 724 [U. S. Comp. St. Supp. 1907, p. 1008], as a trade-mark for "silk dress goods in the piece," gives the proprietor the right to protection against its use on such goods by another, althongh its own goods were of the kind used mostly for linings.

5. SAME-ASSIGNMENT—VALIDITY.

Under section 10 of the trade-mark act of Feb. 20, 1905, c. 592, 33 Stat. 727 [U. S. Comp. St. Supp. 1907, p 1013], which provides that "every registered trade-mark * * * shall be assignable in connection with the good will of the business in which the mark is used," a trade-mark registered under the act cannot be assigned unless such good will is also transferred, and, where a trader had sold a particular article under a selected name to such extent as to secure registration, an assignment of the trade-name confers no rights on the assignee if the assignor continnes to sell the same article, although under a different name.

2. SAME—RIGHT TO SUE FOR INFRINGEMENT —ABANDONMENT.

Where the proprietor of a registered trade-mark made an assignment of the same, which was invalid to convey any rights to the assignee, but itself discontinued the use of such mark, snch discontinuance operated as an abandonment, and neither assignor nor assignee can maintain a suit for infringement because of the use of the trade-mark by another after such abandonment.

CLANCY v. TROY BELTING & SUPPLY COMPANY.

(Circuit Court of Appeals, Second Circuit. Nov. 7, 1907. 157 F. R. p. 554.)

PATENTS—LICENSE CONTRACT—CONSTRUCTION.

An agreement made by the owner of a patent for a hose clamp, in settlement of a suit for infringement, that he would not trouble the defendant so long as it made only brass clamps, the complainant being then making them of steel, must be construed to apply only to clamps covered by the patent; and the making by the defendant of steel clamps of a different kind, not within the patent, was not a violation of the license which would render a user of its brass clamps subject to a suit for infringement.

EUREKA BLOTTER BATH CO. v. NICHOLAS et al.

(Circuit Court N. D. Illinois, E. D. June 1, 1906. 157 F. R. p. 556.)

PATENTS—INFRINGEMENT— BLOTTER BATH.

The Fairbank & Cantril patent, No. 604,841, for a blotter bath, while it shows only a slight advance over the prior art, covers a device more simple and effective than any previously used, and discloses invention; also held infringed.

BENBOW-BRAMMER MFG. CO. v. WAYNE MFG. CO.

(Circuit Court, E. D. Missouri, E. D. Jan. 13, 1908. 157 F. R. p. 559.)

PATENTS—ANTICIPATION-MEANS FOR OPERATING WASHING MACHINES.

The Schroeder patent, No. 535,465, for means for operating washing machines, held not anticipated, valid, and infringed.

CLEVELAND FOUNDRY CO et al. v. AMERICAN STOVE CO.

(Circuit Court, N. D. Ohio, E. D. April 25, 1907. 157 F. R. p. 562.)

PATENTS—INFRINGEMENT—OIL BURNER.

The Jeavons patent No. 475,401, for an oil burner, claim 1, was not anticipated, was the invention of the patentee, and is valid; also held infringed.

EXPANDED METAL CO. v. GENERAL FIREPROOFING CO.

(Circuit Court, N. D. Ohio, E. D. August 6, 1907. 157 F. R. p. 564.)

PATENTS — INVENTION — PROCESS OF EXPANDING SHEET METAL.

The Golding patent, No. 527,242, for a process of making open or reticulated sheet metal work by slitting and stretching the sheet at the same time, is void for lack of patentable invention, in that it describes merely an abstract idea without sufficiently disclosing means by which it may be put into practice.

AMERICAN SULPHITE PULP CO. v. DE GRASSE PAPER CO.

(Circuit Court of Appeals, Second Circuit. Nov. 7, 1907. 157 F. R. p. 660.)

1. EVIDENCE—JUDICIAL NOTICE—PATENTS —PRIOR ART.

Where neither the pleadings nor proof in a suit for infringement of a patent bring into the record the prior art, the court cannot take judicial notice of it on the question of the validity of the patent, except as to matters of general knowledge.

2. SAME—INVENTION—BURDEN OF PROOF.

Whether a patent for a cement lining for wood pulp digesters in which the sulphite process is used, which are large closed receptacles of iron, subjected during the process to great heat and very high temperature, and to the actions of the sulphurous gases to protect the metal shell from injury from such gases and acids, is void for lack of invention, because of the admitted use of such linings in the open vessels to protect them from the action of acids, is not so obvious that the court can so determine without proof, and the burden of proof rests upon one asserting its invalidity.

3. SAME—INFRINGEMENT.

The Russell reissue patent, No. 11,282 (original No. 445,235), for a wood pulp digester having a cement lining of the metal shell, held, on the record, to disclose invention, and its claims to be entitled to a liberal construction to cover any homogeneous structural linings composed of adhesive acid resisting materials in the nature of cement: also held infringed.

HOWARD BROS. MFG. CO. v. GIBBS LOOM HARNESS & REED CO.

(two cases).

GIBBS LOOM HARNESS & REED CO. v. HOWARD BROS. MFG. CO.

(Circnit Court of Appeals, First Circuit. Nov. 8, 1907. 157 F. R. p. 676.)

1. PATENT—INFRINGEMENT —HEDDLE-MAKING MACHINE.

The Gibbs patent, No. 626,900 for a heddle making machine held valid and infringed as to claim 15. Claims 4, 5, 6, 7, 8, 13, and 14 held on this record void for lack of invention.

2. APPEAL—APPEAL FROM INTERLOCUTORY ORDER—EFFECT OF FINAL DECREE.

Where, pending an appeal from an interlocutory order granting a preliminary injunction in a suit for infringement, final decree is entered for complainant, which is affirmed on appeal, the appeal from the order becomes a moot case, and should be disposed by a judgment that the order has been superseded.

LOBEL v. COSSEY.

(Circuit Court of Appeals, Second Circuit. Nov. 7, 1907. 157 F. R. p. 664.)

WITNESSES -- INTERFERENCE PROCEEDING BEFORE PATENT OFFICE — POWER OF COURT TO COMPEL ATTENDANCE BEFORE EXAMINER.

A party to an interference proceeding before the Patent Office, who appeared before a commissioner and testified in his own behalf, cannot, by obtaining the consent of the other party to adjournments until it is too late to enforce his attendance by a subpœna within the time limited by the Commissioner of Patents for closing the testimony, and then refusing to further appear, deprive the other party of his right to cross-examine, and the Circuit Court, on proper application therefor, may make an order requiring him to appear thereafter for further cross-examination, and enforce obedience thereto by proceedings for contempt.

CONSOLIDATED RUBBER TIRE CO. et al. v. DIAMOND RUBBER CO. OF NEW YORK.

(Circuit Court of Appeals, Second Circuit. Nov. 7, 1907. 157 F. R. p. 677.)

1. PATENTS—SUIT FOR INFRINGEMENT—PRELIMINARY INJUNCTION.

Where a patent has been adjudged valid and infringed by the Circuit Court of Appeals, a circuit court within the circnit may properly grant a preliminary injunction against infringement by another, on a showing that the two alleged infringing devices are not materially different.

2. SAME—REVIEW ON APPEAL.

An appeal from an order granting a preliminary injunction against infringement of a patent brings up for review the propriety of the action of the Circuit Court in granting the injunction only, and the case will not be considered on the merits.

ROSS v. DOWDEN MFG. CO.

(Clrcuit Court of Appeal, Eighth Circuit. Nov. 4, 1907. 157 F. R. p. 681.)

PATENTS—INVENTION—POTATO HARVESTER.

The Ross patent, No. 640,816, for an attachment to potato harvesters, consisting of an auxiliary conveyer having a hinged connection with the frame of the harvester and means for adjusting it vertically, its purpose being to assist in cleaning the potatoes before they are dropped upon the ground, is void for lack of invention; the device being the same in principle as the primary conveyer to which it is supplementary and adjusted by means well known in the mechanic arts, the production of which required no more than mechanical skill.

NATHAN MFG. CO. v. DELAWARE, L. & W. R. CO. et al.

(Circuit Court of Appeals, Second Circuit. Nov. 7, 1907. 157 F. R. p. 685.)

PATENTS — INVENTION — LUBRICATOR FOR LOCOMOTIVE ENGINES.

The Woods patent, No. 645,026, for a lubricator to snpply oil to the valves and cylinders of locomotive engines, claims 1 and 2 which cover broadly means by which the feed is increased when the throttle is open, and decreased when the throttle is closed by the use of two distinct passages, one constant and one shifting in size by the automatic action of a valve governed by the steam pressure, in view of the prior art, which shows a single passage made larger or smaller by the movement of a valve, and especially of the McCoy patent, No. 179,585, are void, as broader than the invention.

AIKEN v. NATIONAL TUBE CO. et al.

(two cases).

(Circuit Court, N. D. Ohio, E. D. August 6, 1907. 157 F. R. p. 691.)

PATENTS—VALIDITY AND INFRINGEMENT— APPARATUS FOR CONVEYING METAL PLATES.

The Aiken patents, No. 450,360, for an apparatus for conveying and cooling metal plates, and No. 492,951, for an apparatus for straightening metal plates, together cover a combination of parts, which, co-acting and operating successfully as to each particular plate, convey the plates from the rolls in a mill to the trimming shears, straightening and cooling them on the way. The combinations are new and useful, and the patents disclose invention; also held infringed.

MECHANICAL INVENTIONS AND DESIGNS.

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Stephen S. Gardiner, Lincoln, Neb. Brick Machine.—An object of the invention is to provide a brick machine, designed particularly for rapidly molding bricks or blocks of cement, and adapted for simultaneously making a plurality of bricks or blocks, and capable of enabling the same to be quickly and conveniently removed from the machine onto a pallet.

Parx O. Hays, Gainesville, Texas. Acetylene Gas Generator.—This invention relates to means for generating acetylene gas, and comprises a float that constitutes the operating means for the carbid-controlling valve, and is actuated in a novel manner by rising and falling water, moved by the varying pressure of gas in the combined gas generating and liquid reservoir.

George R. Williams, Findlay, Ohio. Molding Machine.—This invention relates to means for forming molds for metal castings, and has for one of its objects to provide a machine wherein the weight placed upon the movable parts is substantially balanced, so that lateral or side strains are, to a great extent, avoided, thereby eliminating abnormal binding and wearing action between the elements and maintaining the same in proper relation. A still further and important object is to provide novel flask elevating means which act in conjunction with the pattern-moving means, and effect the detachment of the flask section from its positioning means when the pattern is drawn from the mold.

Benjamin F. Rogers, Buffalo, N. Y. Sectional Furnace for Hot Water Heating.—This invention relates to boilers of that type employed in hot water heating systems, and comprises a structure having a comparatively great heating surface, a portion of said surface being embedded directly in the hottest part of the fire. Another object is to provide a novel boiler wherein the furnace is divided into a plurality of compartments, in either or both of which fire may be maintained, in order to conveniently vary the heating capacity of the boiler.

William A. Kelso, Philipsburg, N. J., inventor; Frank A. Hilburn, and Arthur Richards, Easton, Pennsylvania., assignees. Rotary Engine.—This invention relates to rotary engines and, while particularly applicable for driving rotary drills and the like, it is not limited to this employment. The principal object is to provide a compact structure, capable of developing power and high speed, and composed of parts that are simple in their nature and are not liable to derangement. Another object is to provide a valve-operating mechanism that is actuated by a single operating device to control the movements of the motor. A third object is to provide a structure wherein the working parts are completely enclosed, whereby the motor is peculiarly adapted for use under water.

Joseph W. Howard and Robert M. McKee, Greeneville, Tenn. Index Cell. Case Equipment for Delivery of Mail.—This invention relates to means for carrying mail while the same is being delivered, and embodies improvements over their former patent No. 765,893. The invention is susceptible of use for city or rural delivery. One of the objects is to provide a supporting harness or gear which can be conveniently applied and removed, is readily adjustable, and permits of easy access to the mail-holding receptacles and the detachment and replacement thereof, as the same becomes necessary or desirable.

Horace M. Murray, Seligman, Mo. Coffee Pot.—The object of the invention is to provide a coffee pot, equipped with straining means for holding the coffee and adapted to condense the steam and vapor arising in the coffee pot, whereby the full strength of the aroma will be preserved. Another object of the invention is to provide a coffee pot, having a condensing lid adapted to be positively held in a closed position by the hand grasping the handle of the coffee pot, while pouring out the contents thereof.

John F. Schwartz, Alma, Mich. Mold.—This invention relates to means for molding building blocks, and embodies means for withdrawing the blocks formed in the mold from the face-forming wall, so that the danger of marring or otherwise injuring the exposed ornamental faces of such blocks is reduced to a minimum. Another feature relates to means which will permit the ready expansion and contraction of the molds, in order that blocks of different sizes may be made thereon.

John F. Schwartz, Alma, Mich. Tile.—An object of the invention is to provide a tile, equipped with protecting means to prevent it from cracking as it is removed from the mold, and from falling down and collapsing before the cement has set, and also from being rubbed or checked by handling. Another object of the invention is to provide a device adapted to cause the cement to dry more uniformly than heretofore, and to prevent the outside cement from drying too quickly and thereby causing the tile to crumble.

Addison Vandervoort, Belleville, Ont., Canada. Tire.—This invention relates to improvements in cushion tires and comprises a structure that will afford an elastic support; is not liable to collapse, and thus is not open to the objectionable features of pneumatic tires, but posseses all their advantages.

Addison Vandervoort, Belleville, Ont., Canada. Lawn Sprinkler.—An object of the invention is to provide a lawn sprinkler having a nozzle, adapted to swing in the path of a circle, so as to sprinkle a large area of a lawn, and equipped with means for producing an independent rotation of the nozzle upon its longitudinal axis, in order to scatter the stream of water more widely.

Richard Kersey, inventor, Lexington, Ky.; James T. Bailey, assignee, McBrayen, Ky. Mail Sack Exchange Mechanism for Railways.—This invention relates to means for delivering mail to, and from, railway cars while the same are in motion, without injuring the same or the contents thereof, and without exposing the mail clerks to danger during such exchange, the mechanism obviating the chance of mail bags falling beneath the trains and thus having their contents injured or destroyed.

Richard Kersey, Lexington, Ky., inventor: E. A. Carr, Lawrenceburg. Ky., assignee. Window Screen.—An object of the invention is to provide a flexible window screen mounted on a spring roller and designed to be connected with the sashes for screening the top and bottom of a window when the sashes are open, and adapted to effectually exclude flies and other insects, and capable of automatically rewinding itself, when a sash is closed, and of relieving the sash of the tension of the spring for rewinding it, so that the spring will not close an evenly balanced sash.

Richard Kersey, Lexington, Ky. Track and Carriage for Swinging Scaffolds.—An object of the invention is to produce a track and carriage for swinging scaffolds, designed for painters and other artisans, and adapted to be readily removed horizontally from one portion of a house to another to save time and labor, and to obviate the inconvenience of lowering the swinging scaffold to the ground and transferring the hooks from one point to another. The invention also has for its object to provide a sectional track, adapted to be varied in length to suit the size of a house and to enable swinging scaffolds of different lengths to be employed.

Richard Kersey, inventor, Lexington, Ky.; Samuel T. Rice, Chattanooga, Tenn., and Ida M. Kersey, Lexington, Ky., assignees. Physicians' Medicine Case.—An object of the invention is to provide a medicine case designed to contain bottles, surgical instruments and various other articles, and equipped with means for holding inner and outer rows of bottles at the same elevation to insure compactness when the case is closed, and their location at different elevations when the case is open, so that the labels of all the bottles will be exposed to view, in order that any one of the bottles may be removed without touching the others or disturbing the contents of the casing.

Edward D. Carter, Houston, Tex. Cotton Condenser.—An object of the invention is the production of a condenser, especially adapted for the formation of a thick bat, suitable for employment in the formation of a round cylindrical bale, and equipped with a series of condensing cylinders, arranged to deliver their individual comparatively thin bats or accumulated lint to a bat former common to the series of cylinders, and adapted to multiply or combine the thin bats to form a bat of increasing thickness, which will be opposed to a small portion only of the surface of each cylinder, and which will be located exclusively at that side of the series of the cylinders opposite the gin flue, whereby the major portion of the several cylinders are free for the passage of air therethrough, to obviate the necessity for the employment of doffer rolls or other cylinder clearing mechanism within the gin flue.

Edward D. Carter, Houston, Texas. Continuous Weighing Scale.—An object of the invention is to provide a scale, designed for continuously weighing material in bulk, such as grain and the like, and equipped with an oscillatory receiver, having a pair of compartments adapted to be alternately filled and discharged, and capable of adjustment to vary the amount weighed without adding weights to, or removing them from, the scale.

Edward D. Carter, Houston, Texas. Automatic Weighing Machine.—An object of the present invention is to provide a weighing machine, having a plurality of compartments to receive the material to be weighed, and adapted to lessen the flow of material as the scale beam approaches the poising point, and capable of rapidly changing the position of the compartments to shift the full compartment from beneath the supply spout or hopper, and transfer the empty compartment to the same, whereby an accurate weighing of the material is effected without entirely cutting off the flow of material and permitting the same to accumulate within, and clog the supply spout or hopper.

Lucien B. Edgar, Colorado Springs, Colo., inventor; Charles J. Beaven, Colorado Springs, Colo., assignee. Seal Lock.—An object of the present invention is to produce a seal lock, designed for use on freight cars, mail sacks, etc., and capable of being readily applied to a car or sack to be sealed, and of effectually preventing the same from being opened without destroying the seal lock.

Clarence T. Eward, Greensburg, Ind. Vapor Lamp.—This invention relates to vapor lamps, and has for its object to provide a novel, simple and effective torch or heater that will employ the ordinary illuminant used for the lamp; will either effect a rapid preliminary heating of the vaporizer or will maintain the same at all times in condition for instant use; may be made to act as an igniter for the lamp, and may be employed in connection with a variety of types of lamps of the above character.

Hiram W. Ru Ton, Goshen, Indiana. Carpet Sweeper.—It is a well known fact that when floor or carpet sweepers of the ordinary type are operated, the same are liable to tilt or turn upon the bail pivots when the sweeper is drawn toward the operator. One of the objects of this invention is to provide a simple means for connecting the handle or bail to the sweeper case, said means effectively preventing the undesirable tilting action, and furthermore being readily applicable to the sweeper case without the necessity of cutting or otherwise carefully fitting the parts in place.

Turner H. Nance, Talladega, Ala., inventor; Rice H. Woodward, same place, assignee. Cloth Measuring Machine.—This invention relates to means for measuring cloth or any similar material that is flexible and is in the form of sheets, strips or the like. One of the objects of the invention is to provide a mechanism of the above character that will unwind the cloth, etc., accurately measure, and register the measurements of the same, and rewind the material so measured, without wrinkling or otherwise injuring or disfiguring it. The structure is further adapted to measure cloth, ribbons, etc. of different widths, and reel the same into circular form or into bolts of the usual flat shape.

James T. McElhinny, Evansville, Ind., inventor; John H. Fendrich, same place, assignee. Typewriting Machine.—This invention relates particularly to means for controlling the movement of the paper carriage of a typewriting machine, and has for its principal object to provide means whereby the carriage may be moved backwardly step-by-step a single space at the time, so that changes and corrections may be made with greater ease and expedition than with the ordinary carriage now in common use, which the operator has to grasp and manually return to the desired position, requiring considerable care and attention.

James T. Barker, West Plains, Mo. Trace Buckle.—This invention relates to means for connecting crossed-straps, and more particularly traces and back-bands of harness, and has for its principal object to provide a novel, simple and inexpensive device that can be readily applied to the straps and constitute an effective lock for securing them in place.

Jesse A. Heydrick, Butler, Pa. Drafting Apparatus.—This invention has particular reference to mechanism for plotting, producing drawings, and also reproducing drawings on enlarged or reduced scales. One of the objects of this invention is to provide a mechanism for effecting the various computations and securing the different positions for architectural, engineering and mechanical drawings with the utmost accuracy and expedition, the various manipulations necessary being easily comprehended, readily effected, and involving no intricate preliminary computations.

NEW PATENTS FOR SALE.

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FOR SALE—A patent machine for rowing a boat. Always in order. Safe for a child. One man can do the work of three men. Will dispense with oars. Address, Harvey T. Schweers, 524 Howard St., Petaluma, Cal. my

FOR SALE—U. S. Patent No. 873,893, issued Dec. 17, 1907. Canadian Patent No. 113,268, issued July 28, 1908. Improvements in Bag Holders. Will take the first reasonable offer. Address, Otto A. Pust, Holloway, Minn. my

FOR SALE—U. S. Patent 904,019, dated Nov. 17, 1908. Automatic Wire Stretcher. Works on new principle. Simple and effective. Desire to sell outright. A bargain if sold quickly. Address, Earnest F. Schuster, Geneva, Nebr. my

FOR SALE—U. S. Patent No, 906,351, dated Dec. 8, 1908. Planter used for planting almost every kind of seed at predetermined intervals. Send for copy of patent and terms. Address, A. A. Wofford, Statham, Ga. my

FOR SALE—Patent No. 904,498. An attachment to be used on all kinds of farm implements in tilling the soil. Reduces cost from 25 to 50 per cent, and gives better service. Address, John Pierson, Ingersol, Okla. my

FOR SALE—Patent No. 896,030. Improved Singletree for use in orchards, vineyards, hop yards, etc. No trees or shrubs destroyed where this singletree is used. Will sell like hot cakes in fruit-growing localities. Write A. E. Levins, Vernon, B. C., Canada. my

FOR SALE—U. S. Patent No. 903,582, dated Nov. 17, 1908, Canadian Patent No. 110,664, dated March 14, 1908. Improved Toaster. One lady writes, "I find it one of my most useful household utensils." Costs 5 cents. Retails for 35 cents. Address, J. J. Frith, Boissevain, Manitoba, Canada, my

FOR SALE—U. S. Patent No. 902,576 and Canadian Patent No. 112,536. Collar Stay. A very useful thing. Cheap to manufacture, and great seller. Can be used on any coat. Any reasonable price will be accepted. For description and drawing, address, H. C. Gustafson, R. F. D. No. 1, Box 20, Souris, N. Dak. my

FOR SALE—On account of poor health, my Friction Clutch Pulley, Patent No. 654,162, 1900, and Lamp Attachment No. 908,015, December, 29, 1908. Send for circular, Fred L. Kuhn, Fitchburg, Mass. my

FOR SALE—U. S. Patent No. 891,036. Self-Ejecting Penholder. Slight pressure on upper end ejects broken or damaged pen from holder. Address, Edward Browning, Boone, Iowa. my

FOR SALE—Patent No. 905,141, dated Dec. 1, 1908. Terminal Insulator. Simple, practical and easily manufactured. Correspondence solicited, with manufacturers of electrical devices. Address, L. L. Bogul, East Orwell, Ohio. my

FOR SALE—Patent No. 903,822, dated Nov. 10, 1908. Hen's Nest. Will sell outright or by territory. A necessity for every farmer. Address, James Kirkham, Newton, Jasper County, Ill. my

FOR SALE—Newly patented nut lock washer. A perfect locking device. Great money maker. Write for free sample. Address, Frank Matousbek, Gregory, South Dakota. my

FOR SALE—U. S. Patent on a non-refillable bottle, No. 898,575, patented Sept. 15, 1908. For sale at reasonable price, or let on royalty. Send 10 cents to the publisher of "Inventive Age," (giving this patent number) for a copy of the patent giving full description of same, or write to me for particulars in the matter. Reuben R. Graves, R. F. D. No. 3, Box 35, Salem, Oregon. apr

FOR SALE—U. S. Patent No. 904,012. Detachable tool handles. Address, Henry F. Pocan, Mariuette, Wisc. apr

FOR SALE—Patent No. 905,059. A simple foldable lace curtain stretching and drying frame; works automatically; is neatly folded; can be made quite cheaply. Will sell reasonably for cash or on royalty. Address, Peter J. DeVries, Hull, Iowa. apr

FOR SALE—Patent No. 797,887, Pail Cover. For cash, or cash and royalty. Address, C. F. Dibble, Rochester, Minn. apr

FOR SALE or royalty.—Patent No. 902,128. Land marker for corn planters. Self-lift. Address, Elmer Youtz, Casner, Ill. apr

FOR SALE—An entirely new idea of a swing for amusement. Address, Fred Wiefericb, No. 336 High School Ave., Council Bluffs, Iowa. apr

FOR SALE—Patent No. 899,878. Reaper. Under shop or royalty plan. Offers to be considered before March 1, 1909. Address, T. E. Lind, Moose Jaw, Sask., Canada. apr

FOR SALE—Patent No. 896,619, dated August 18, 1908. A feed bag that does away with the waste of grain. Will sell reasonably. Address, L. M. Burke, Lay, Colorado. apr

FOR SALE—Patent No. 885,216. A mail pouch deliverer and receiver. Easy to manufacture. Made of piping. Will sell cheaply if at once. Need the money on other patents. Address, John Anderson, Box 265, Waurika, Okla. apr

FOR SALE—Patent No. 901,396, dated October 20, 1908. Car truck for street or trunk roads; will sell all or part; or will consider proposition to manufacture and market. Address, Richard Smith, Lock Box. 313, South Broadway Station, Denver, Colorado. apr

FOR SALE or on royalty—U. S. Patent No. 895,940. Envelope. Cannot be opened without detection. Contains two separate pockets. Cannot be detected from an ordinary envelope when sealed. Address, William P. Ballard, Wallowa, Oregon. apr

FOR SALE—Patent No. 901,407. Grave Attachment. Has mirrors arranged in a novel manner so that the face of the dead may be viewed from outside the grave. Address, George H. Willems, Roanoke. Ill. apr

FOR SALE—Patent No. 901,325. $5,000 will secure an active or silent one-half interest in an up-to-date toy that will return investment on first year's sales. Will sell outright for $8,000. Act quick. Address, William H. Davis, Federalsburg, Md. apr

FOR SALE—Patent No. 899,675, dated Sept. 29, 1908. Attachment for ironing boards; an article that is wanted by every house wife: will sell outright at reasonable price; have not means to manufacture. Address, Joseph Micbael, 446 North Railroad St., Pottsville, Pa. apr

FOR SALE—Automatic Show Case. Can be made in several sizes. Adapted for fountain pens and jewelry especially. Convenient and simple. Will sell cheaply if taken at once. Address, L. Peters, Marinette, Wisc. apr

FOR SALE—Patent No. 904,706, dated Nov. 24, 1908. Mink and muskrat trap. Best trap on market. Will catch as many as seven rats at one time. No lost rats or broken legs. Make me an offer. Write, B. A. Mastenson, Route 2, Ortonville, Minn. apr

FOR SALE or royalty—U. S. and Canadian patents No. 869,134. Collapsible Crates. Made of wood and metal. All parts are permanently connected; has locking ears. Can be quickly set up, or folded. This is the invention you want to revolutionize the crate business. Can be used for all kinds of fruits. I will sell outright or state rights. Canadian patent at your own price. Make me an offer. Write, Perry E. Boyd, Canton, Ga. apr

FOR SALE—U. S. Patent No. 902,831, dated Nov. 3, 1908. Self-lubricating bushings for pulleys. Will sell outright. Write C. A. Petersen, P. O. Box 41, Laconia, N. H. apr

FOR SALE—U. S. Patent No. 882,396, dated March 17, 1908. Lantern Holder. Address, C. W. Leaning, Lock Box 3, Yankton, S. Dakota. mar

FOR SALE—Patent No. 900,843, dated October 6, 1908. Horse detacher for runaway horses. Holdbacks and traces released at same time in two seconds. Address, J. R. Claxton, Box 60, Doon, Iowa. mar

FOR SALE—Patent No. 896,578. Nut locking device for rail joints. Will sell outright or to each individual railroad, or will sell on a royalty; also to manufacturers. Address, Richard Richards, Albia, Iowa. mar

FOR SALE—Patent No. 898,637. Bridle Bit. The bit that is best by test. Controls most vicious horses. Perfectly humane. A bargain if sold at once. Address, D. S. Gallatin, Dalton, Ohio. mar

FOR SALE—Patent No 899,923. A safety trace holder. Very simple and easily applied by any body. Will sell patent outright or manufacture on royalty. Address, John Unger, P. O. Box 263, Louisville, Colo. mar

FOR SALE—Patent No. 898,287, dated Sept. 8, 1908. Steel Railway Tie. By combination a new device for the railway and railroad man and manufacturer who are ready to consider a good thing for the future. Address, A. O. Thunborg, Webster, Burnette Co., Wisc. mar

FOR SALE—U. S. Patent No. 898,820, dated September 15, 1908. Stone Dressing Machine. Will cut two sides of stone at one operation without turning stone over. No chips in the way. Will not chip or stun stone. For particulars address, J. C. Armstrong, Newkirk, Okla. mar

FOR SALE—Power Wheel. No dam. Works regardless of frost or flood. For mills, dynamos, or irrigation. No. 107,660 Canadian, No. 896,867 U. S. A., patented August 25, 1908. Address, W. P. Spooner, Carievale, Sask., Canada. mar

FOR SALE—Patent No. 901,917, outright. A very valuable and useful crib made of wood. Can be manufactured very cheaply. Address, Theodore Kreisel, Warrenton, Va. mar

FOR SALE—Patented 903,719, dated Nov. 10, 1908. Danger Signal for Automobiles. Applied to the rear of automobiles to prevent rear end collisions. Has utility in other directions. Address, Oscar Herrmann, No. 65 Central Park West, New York City. mar

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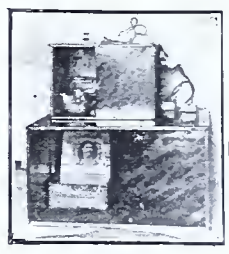
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The Inventor As His Own Attorney.

There is a very prevalent impression among inventors who have never obtained a patent, that the only thing necessary is to write a description and send it to the Patent Office, something after the manner of filing a land claim; and that in due course protection will be granted, without the intervention of a patent attorney. Such applications are received daily by the Patent Office, and they are invariably returned to the inventor, with directions for preparing the drawings, specifications and claims according to the elaborate red-tape required by law, and often with the additional advice that the applicant obtain expert assistance in making out the papers. It not infrequently happens that a case before a law court is conducted by a plaintiff in person; but unless an inventor has studied patent law and is therefore in effect a patent attorney himself, it is as difficult for his unaided efforts to achieve success in prosecuting an application for patent, as for a person who has never studied chemistry to isolate the acid radicals of tertiary amides. To properly prepare a specification, and especially to properly word the claims, a man should have a wide knowledge of the state of the art —that is, he should know what inventions, similar to his own, have already been patented in this and in other countries, so that he may avoid any anticipatory devices in making his claims, and at the same time demand everything to which he is justly entitled. Technical expertness is also needed in making amendments. Most applications are rejected on the first action by the Office, but it does not follow by any means that they have permanently failed of protection. The change of a few words, the alteration of a claim, often is sufficient to obtain a grant. In other cases, complicated amendments and prolonged argument are necessary. It may be thought that since it is the function of the Patent Office to grant patents, its policy should, on the whole, be favorable toward applications. If one may judge by the actions of many of the Examiners, the reverse is the case. Their attitude is like that of the French courts, which hold an accused person guilty, and put upon him the burden of proving himself innocent. They regard an application for patent with similar suspicion, and it takes a veritable Port Arthur struggle to win a favorable decision. No one who is not equipped with a knowledge of the history of that branch of invention, and who has not had experience in handling applications, has a ghost of a chance of victory.

Selling Patents.

Inventors frequently fail to sell their patents because of the artificial valuation they put upon them. It is true that great fortunes have been made in patents, but the man who refuses a fair offer for his device in the hope of becoming wealthy through this instrumentality, makes a great mistake. Novices in the line of patents are always misled by the attractive advertisements "Inventions Wanted — "$100,000 for One Patent—$50,000 for another" that are issued by a certain class of patent attorneys and patent sale agents whose sole object is to fleece the unwary. While it is true, as above stated, that some inventions have unquestionably brought riches to their owners, the number is negligable in comparison with those that remain buried and forgotten in the archives of the Patent Office, never to come to light except to anticipate subsequent inventions. The majority of inventions are never sold at all, and are never manufactured. This may be due to lack of exploitation, or to some weakness in the original patent, or to the absence of appreciation on the part of the public: the result is the same. On the other hand, a great many men who have invented some simple device, such as a gate latch or a window fastener, receive offers of a few hundred dollars from people who are impressed with the utility of the apparatus, and who hope, of course, to make more out of it. The editor is frequently requested to give advice in cases of this character, and we invariably urge the acceptance of such offers, on the principle of a bird in the hand. While this does not apply as generally to elaborate electrical apparatus, or other complicated machinery which may have involved time and expense in perfecting, it will be found a safe rule to follow.

New Catalogues.

The Norman W. Henley Publishing Company has issued a new catalogue of books which will be of interest to engineers and technical men in general. It includes works on locomotive engineering, hydraulics, electricity, fuel economy, compressed air, sheet metal working, heating and lighting, mining, gas engines, and a variety of other subjects, including dictionaries and manuals for inventors. The catalogue will be sent free to any of the readers of the INVENTIVE AGE who will write to the above firm at 132 Nassau St., New York.

Salving Wrecks.

The question of raising the steamship Republic from its deep sea bed off Nantucket, is being generally discussed in marine circles. It is the opinion of the majority that the vessel, the wreck of which forms one of the most dramatic pages in the annals of the sea, lies at too great a depth for rescue. The work and danger involved in salving a wreck, even under propitious conditions, can be appreciated only by those who have witnessed it. The fact that so many hulks are saved speaks eloquently of grit and audacity of the courageous workers, and not of the ease with which the task can be done. Even when not submerged in deep water, the wreck is usually an unwieldy mountain of steel and oak, weighing thousands of tons, dangerous to approach. This cumbrous mass must be lifted bodily and floated, from the decks of pitching, unstable scows or barges. Of all the professions that demand heavy toll of human life, none—not even mining or powder making, not even the task that requires men to burrow through quicksands beneath river beds, or to cling like flies to swaying steel beams hundreds of feet in the air—is as perilous as wrecking. Every year these adventurers brave wave and storm to lift a ship from rocks, or raise a sunken hulk. They are exposed to the dashing of winter seas, which carry pneumonia in their wake; many have had legs frozen in the pursuit of their duty, and not a few are the bones that have been broken in removing masts or slinging pumps.

To raise a boat lying in deep water, divers go down and seal the breaks in the hull. Huge chains, hundreds of feet long and weighing thousands of pounds, are then passed under the hull, and further attached to pontoons. The water is then pumped out of the hull, air forced in, and the wreck lifted. On each side of the hull tower cnormous derricks, the function of which is not merely to help lift, but to prevent the lightened and top-heavy vessel from capsizing when it finally reaches the surface of the water. A dozen pumps are used in a wreck of any size, pumps as large as the mortars of a fortress. These are floated alongside the hulk, and hurl into the air torrents of seething water, each at the rate of 4,000 gallons a minute. In case the ship has been loaded with wheat or similar cargo that would swell and burst the hull, the pumps suck up the grain before beginning their regular work—drawing it up as if they were grain elevators. One of the difficulties that arise is that the withdrawal of the water by the suction pumps causes the decks for a time to remain unsupported from within. The tremendous mass of the ocean bearing upon these decks would crush them like egg shells. To prevent this, the wreckers fill the hull with huge rubber air bags, inflated with compressors. These displace the water in the hull, and being buoyant, bear up against the underside of the decks, offsetting the strain. Another method when the hulk is in an accessible place, is to have the divers build a cofferdam—a kind of huge fence reaching from the sides of the ship to above the water. This is pumped out to relieve the pressure, so that the wreck may be raised enough to be towed into shallower water where the cofferdam is removed and the ship lifted by the ordinary method.

Exhibit of New Inventions.

An exhibition of patent novelties will be held in Madison Square Garden, New York City, during the last week of June, 1909. The object is to show the general public models of important patented inventions that may not be generally known. The wireless telegraph will be displayed in operation, receiving messages from ships on the ocean; the wireless telephone will be shown, transmitting the human voice eighty-five miles. There will be daily concerts by the telharmonic, one of the most mystifying devices of the age; and the latest products of inventive genius in airships, submarines, telegraph typewriters, the telepost, etc., will be exhibited for close inspection. The decorations, it is promised, will be costly and elaborate, including a fine electrical display. An effort will be made to attract manufacturers, and the exhibition will be advertised in various ways. Each exhibit, with the name of the inventor, his address and the location of the exhibit, will be listed in a catalogue for general distribution. Demonstrators will be constantly in attendance. Any inventor desiring information as to space, etc., should address the National Patent Novelty Exhibition Company, Real Estate Trust Building, Philadelphia.

Another Ocean Giant.

The new leviathan that is being built in Belfast, Ireland, for the White Star line, will again break the records for size, and be the largest ship that the world has ever seen. The twin monsters Lusitania and Mauretania, of the Cunard line, are each 790 feet long. The Olympic, as the new boat will be named, will be 50 feet longer. The Lusitania has 45,000 tons displacement; the Olympic will register 50,000, and it will exceed its rival by 45 feet in height of funnels. This vessel will be built, however, not for speed but for comfort. She will make but 21 knots an hour, and will require fully five and half days to make the trip from Sandy Hook to Queenstown. But she will carry more passengers than have ever before embarked together, and they will have the benefit of cafes, elevators, a music hall and countless other conveniences and amusements.

The Olympic will be propelled by a combination of turbines and reciprocating engines, which will drive four screws, and the cost will be $7,000,000.

THE INVENTIVE AGE contains sound advice to inventors and patentees. For lack of such advice many have lost money. Subscription price, one dollar a year.

SCIENTIFIC PROGRESS.

Mercury Carbon Lamp.

A new form of glow lamp has a filament of carbon, but burns in an atmosphere of mercury vapor instead of in a vacuum, as with ordinary lamps. This atmosphere of mercury vapor is secured by volatilizing a drop of mercury, placed within the U-tube containing the filament. The increase in efficiency, says the *Illuminating Engineer*, is due to the high temperature, the envelope of hot mercury vapor restricting the condition of heat from the filament and so raising the temperature of incandescence.

Disinfecting With Sugar.

In many parts of Europe it is a common practice among the people to burn sugar in sick rooms, a custom which has been regarded by physicians as an innocent superstition, neither beneficial nor harmful. Now, however, it has been discovered that burning sugar develops a powerful antiseptic gas. One of our consuls in Germany describes the experiments. A small quantity of sugar was burned under a glass bell, the result being formic acetylene-hydrogen. After the vapor had cooled, bacilli of typhus, tuberculosis, cholera, smallpox, etc., were placed in the bell in open glass tubes, and within half an hour all the microbes were dead. If sugar is burnt in a closed vessel containing putrified meat or rotten eggs, the offensive odor disappears at once. The popular faith in the disinfecting qualities of sugar seems, therefore, to be well founded.

New Lighting Device.

Those who suffer from the extortions of the gas companies will hail with anticipation the announcement of a discovery which will cut down the bills one-half. The device, for which credit is due an Englishman, makes use of a new petrol-air gas. This gas is made by the carburetting of air with a small portion of petrol vapor, the resultant mixture being highly illuminating, non-explosive, without smell, and without injurious effects if inhaled. Applied to special burners, it gives off enough heat to be serviceable for either cooking or heating purposes, as well as for lighting. The best thing about this new gas is the price; it costs under 24 cents a thousand cubic feet to produce. A 125 candlepower burner costs only one-fifth of a cent an hour, and will illuminate a large room. At an expense of two cents, enough gas can be supplied for 8 hours to a radiator capable of heating an ordinary room. The mechanism which makes the gas is small, compact and simple. A producing plant capable of supplying 25 lights can be made for about $100.

Cleaning Old Bricks

The principal objection to using bricks which have been used before is the labor involved in cleaning away the mortar with which they have been held together. A machine for doing this rapidly and cheaply has been invented. It does away with hard labor entirely, so far as the cleaning process is concerned, and one machine alone will clean from 15,000 to 20,000 bricks a day. It is a great labor-saving device, and it is claimed that it does the work more thoroughly than hand methods. The bricks are fed into the machine by one man and carried away by another. The machine is belt-driven from a gas or steam engine, or other convenient source of power. The cleaning is done by passing the brick upon a traveling belt or chain between two revolving discs, which carry heavy teeth upon their faces. When two sides have been cleaned by the disc the brick is turned over automatically, and the other faces are cleaned in turn. The invention is owned by a company in Iowa which holds the patent. The machine is said to give very satisfactory service, and is a boon to all those engaged in the work of demolishing brick buildings, expediting the cleaning up process considerably, and reducing the cost.

Substitute for Celluloid.

Everyone knows how dangerous the moving picture machine is, on account of the extreme inflammability of the celluloid film on which the negatives are raced in front of the projecting light. Some serious disasters have resulted from the explosion of these films, one in Pennsylvania not long ago resulting in the destruction of the building and the loss of many lives. The celluloid film has such a dangerous tendency to explosion that it is impossible to adjust it in the apparatus without full protection from the source of light. If it is exposed a second, it begins to smoke, and if exposed four, it bursts into flame. This property of celluloid makes the handling of the cinematograph a very delicate matter, and inventors have long been endeavoring to find some substitute. Gelatin in a variety of forms has been tried, as well as other albuminous bodies; but there is always a lack of strength, plasticity or transparency. The problem has at length been solved, says the *Pathfinder*, by a German inventor, who has produced a form of acetyl-cellulose called cellit. Unlike celluloid, it is not brittle; it resembles leather in pliability. In fact, it is claimed, it has all the good qualities of celluloid, such as luster, tenacity, evenness, transparency, etc., without sharing its liability to tear or explode. Cellit does not take fire immediately when a match is applied to it, and it burns very slowly when it does ignite. The flame is small and the substance tends to melt, as does sealing wax, so that while the molten substance falls down in drops, the fire is often extinguished. In the cinematograph the cellit film is entirely incombustible. It may be exposed to the rays of the most powerful arc light without danger of ignition. The only damage done after prolonged exposure is a blistering and general shrinkage of the surface exposed, after which no farther changes take place. Exhaustive tests of this substance have shown it to be a safe and serviceable substitute for celluloid.

Great Storage Dams in the West.

The largest artificial lake in the world is now being constructed by the Government Reclamation Service in Arizona. When completed, it will be a body of water 25 miles long, in places over two miles wide, with a maximum depth of 220 feet. It is the main feature in the project of irrigating lands in the Salt River Valley, near Phoenix. This huge reservoir is only one of the gigantic works that Uncle Sam is now undertaking in the West, in connection with the irrigation plans. The building of great dams is necessarily the first step in the development of any comprehensive scheme for the preservation of our natural resources, including, as such a scheme must, the control of the rivers for the prevention of floods, for their development as waterways, and for the economical use of their waters for power and irrigation.

On account of the peculiar difficulties encountered in dealing with rivers of the arid regions, which are subject to high and sudden floods, the construction of these huge works calls for engineering ability of the most distinguished order. Some of these difficulties are interestingly described in a recent magazine by Henri V. Lemenager, of the United States Reclamation Service. Tunnels are first bored through the walls of solid rock around the site for the dam, and the river is diverted during the progress of the work. After the dam is finished, this tunnel also serves as a regulator for the flow of water from the reservoir. The Salt River Valley is generally conceded to be one of the roughest pieces of country on earth; and transportation facilities were entirely wanting. A road had to be built along the edge of the canyon, and it is eloquent of the character of the country that some stretches of this line cost $25,000 a mile. The walls of the mountain are covered with perpendicular webs of ladders, and cage-carriers for the workmen hang suspended from cables that transverse the canyon. A power canal was constructed for the development of electricity, water being diverted from a point further up stream and delivered at the power house located at the foot of the dam. From this plant electric power is furnished for all the operations connected with the project, and thus the river is made to furnish the motive force for building its own controlling works. A completely equipped cement mill has also been erected for the manufacture of the cement to be used in the dam.

Another structure of similar type is being built on the North Platte River, in central Wyoming. It is curious to note, in this connection, that the waters used rise partly in Colorado; they are stored in Wyoming, and are finally distributed upon lands in Nebraska, 2000 feet lower in altitude and 200 miles from the point of storage. Still another, and one that will be distinguished as the highest dam in the world, is being thrown across the Shoshone River in Northwestern Wyoming. This region is one of heavy snow fall, is well timbered, and pursuant to the national policy of forest preservation, is included almost entirely within the great Yellowstone National Forest.

Just below where the two main forks of the river join is a narrow and deep canyon, the almost perpendicular granite walls of which rise to a height of several hundred feet. Through this gigantic crack in the solid rock the melting snows of the watershed above find their only exit, carrying to waste, during the annual flood season of a few weeks, sufficient water to reclaim many thousands of acres of the desert lands of lower altitudes. Within this canyon, at a point of almost ideal natural advantages, is being molded the solid wedge of concrete known as the Shoshone dam.

The height of this towering structure when completed will be 325 feet, or eighteen feet higher than the United States Capitol from the east front level to the crest of the statue. The length of the dam at the top from wall to wall of the canyon will be about 200 feet, and its thickness at the base, 108 feet. In plan it is of the arched type, wherein stability is secured by means of the form as well as the volume of the structure. The apex of the arch is turned up stream to resist the pressure of the impounded waters, and the foundation and abutments are literally dovetailed into the solid granite, the completed structure thus forming a concrete monolith of imposing proportions as well as of tremendous strength and stability. The reservoir will serve for the irrigation of a tract of land of 125,000 acres, extending 50 miles farther down the river.

Interesting as it is to study these great masterpieces of engineering in process of construction. it is still more gratifying to consider the far-reaching benefits that are being brought about through their agency. Not only will they insure an unfailing supply of water for irrigation, but the floods which have created havoc with lands and property will become a thing of the past. Already the practical results of the Salt River scheme are being realized in the opening up of some 400 irrigable homesteads in Wyoming and Nebraska, while for every cubic yard of masonry contained in the Shoshone dam at least two acres of desert land will be assured of an ample supply of water for irrigation, and thus made available for settlement in the years to come.

High-Pressure System for Fire.

In spite of one or two failures, the employment of the high-pressure water system for protection against fire has been so successful in New York as to justify its adoption elsewhere. Without the aid of a single fire engine, and drawing the water direct from the high-pressure hydrants, streams of water are thrown above the roofs of the towering sky scrapers that characterize the metropolis. With a pressure varying from 65 to 300 pounds to the square inch, according to the need, the discharge from the nozzles of say 60 lines of hose, would flood an ordinary city block six feet deep in half an hour. Results that are so uniformly satisfactory mark, it is believed, the beginning of the end of the steam fire engine.

A CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE. This keeps inventors and manufacturers posted in the art in which they are most interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy; twenty copies $1.50.—Please give correct data in ordering.—Address,

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Coal-hole covers, Locking device for.....H. Dahm
Cock, Ball-.....F. Clark
Cock reversible index.....A. C. Schuermann
Comb fastener, Back-.....H. F. Klingele
Combination-lock.....C. H. Cohn
Compressor, Rotary.....H. W. N. Cole
Concentrate unwatering apparatus...P. Hardén
Concrete-incased pile.....J. C. Black et al
Concrete piling and production thereof.....L. Wolfley
Concrete-structure girder, Reinforced-.....G. M. Graham
Concrete-structure reinforcing-frame, 2 pats...G. M. Graham
Conductors to commutator-brushes, Means for connecting.....N. W. Storer
Container.....F. B. Davidson
Cooking utensil.....D. A. Schaefer
Corn-planter.....A. W. Lewis
Corner-iron.....A. L. Sessions
Corset, Form-reducing.....S. Florsheim
Corsets, Means for pinning down waists to....S. Kops
Coupling.....W. S. Reed
Crab-trap.....G. Merle
Cracker-cutting machine.....C. G. Tucker
Crate-forming machine.....J. G. Pinkston
Cream-separator bowl, Centrifugal-.....T. W. Morgan
Cultivator harrow attachment.....J. F. Barbee
Cutting-machine.....L. E. Rice
Delivery system and apparatus therefor.....E. A. Morse
Dental chair.....F. E. Case
Derrick, Extension self-locking portable.....W. A. MacKenzie
Desk, School-.....L. H. Campbell
Die for shaping composition plates.....J. P. Wright
Display-case.....N. N. Bendz
Display-rack.....H. M. Greener
Display-rack.....L. H. Woodcock
Ditching-machine.....D. J. Wren
Docks, piers, jetties, building-foundations, &c., Interlocking construction for.....H. W. Schlueter
Door check and closer.....B. Janelle
Door-closing device.....P. Gerst
Door fastener, Silo-.....K. Kleven
Door-hood.....L. J. and G. W. Koch
Door-lock.....F. W. Goldstone
Door-securer.....J. P. Stoffel
Drill-throttle, Reversible.....R. A. Norling
Drill, Turbo-pneumatic.....J. W. Smith
Drive-wheel, Traction-engine.....A. C., J. M., H. E., and A. T. Johnson
Drying apparatus.....J. E. Kohn et al
Dust-pan.....J. W. and H. L. Christy
Earth-boring machine.....C. L. Beltz
Egg-tongs.....W. H. Richmond
Electric-conductor-terminal floor-box.....M. E. Ames et al
Electric elevator.....W. M. Cummiskey
Electric elevator.....H. F. Gurney et al
Electric heater.....C. V. K. Greene
Electric heater.....W. S. Andrews
Electric-light hanger.....J. W. Carter
Electric switch.....T. M. Smith
Electric switch.....E. B. Wedmore
Electric welding.....C. E. Thompson
Electrical controlling mechanism.....W. O. Haymond et al
Elevator safety device.....H. Watson
Engine carbureter, Internal-combustion-.....J. A. Prestwich
Engine combustion-head, Hydrocarbon-.....F. L. Nichols
Engine electric vaporizer, Internal-combustion-.....H. Hertzberg et al
Engine electrically-heated starting-vaporizer, Internal-combustion-.....H. Hertzberg et al
Engine electrical vaporizer, Internal-combustion-.....H. Hertzberger et al
Engine electrically-operated starting-vaporizer, Combustion.....A. A. Low
Engine external electrical vaporizer, Combustion-.....H. Hertzberg
Engine internal electric starting-vaporizer, Combustion-.....H. Hertzberg et al
Engine operating means, Explosive-.....C. G. Dean
Engine speed-limiting device, Electrically-ignited-explosive-.....F. S. Perrin
Excavating and loading machine.....J. Bingaman
Excavating apparatus.....D. H. Gilson
Explosive compound and producing the same..G. Lezinsky
Extensible case.....E. G. Schriefer
Fabric-cutting machine.....S. J. Sill
Fan, Centrifugal.....A. J. Bowie, Jr.
Farming implement, Combination.....R. H. Powell
Fastening-inserting machine.....F. H. Perry
Feed mechanism, Device for mechanically regulating.....B. M. W. Hanson
Fence.....E. Craig
Fence-post brace.....W. H. Stephenson
Fence-posts, Mold for making cement.....J. M. Denning
Fertilizer-distrihuter.....M. D. Gatling
Fiber-cleaning machine.....A. W. Montgomery
Fibers from reeds, &c., Producing textile.....F. Fuchs
File-book, &c.....J. H. Horwitz
File-wrapper.....W. R. Harris
Finish-removing composition.....C. Ellis
Fire-alarm signaling device....F. C. Crutchfield
Fire-escape.....E. M. Lowy
Fire-extinguishing apparatus.....C. E. Buell
Fire-extinguishing apparatus for wells.....M. E. Layne
Fire resisting curtain, Flexible..E. H. McCloud
Fire-shutter, Automatically-closing.....A. Rush
Firearm, Magazine-.....A. J. Savage
Firearm recoil-absorber.....G. Easdale
Fireproof girder.....W. Herbst et al
Flushing mechanism.....A. Succop
Folding chair.....O. W. Potter
Folding table.....W. R. Burlingame
Fruit-processing machine.....J. Wilkie
Furnace-charging apparatus.....F. C. Roberts
Furnace-charging mechanism.....D. Baker
Furnace fuel-feeder.....D. F. Nisbet
Furnace smelting, Blast-, 2 pats.....J. W. Nesmith
Furnace tap-spout, Smelting-.....F. D. Gross
Furniture leg and apron..M. S. Goldsmith et al
Galley-stop.....W. D. Rent
Game-board.....A. A. Stocker
Garbage-treating apparatus.....A. J. Morse
Garment-hanger.....A. Schlang
Garment-hook.....L. A. Yeiser
Garment-stretcher.....B. F. Kelly
Garment-supporter, Combination.....C. W. Thompson
Garments, Means for adjusting the waistbands of.....M. S. Erlanger
Gas and like fluids, Prepayment apparatus for delivering.....W. Cox et al
Gas cut-off, Automatic.....H. Niemann
Gas-generating crucible- furnace.....E. H. Schwartz
Gas-generator apparatus for producing combustible gases.....G. Marconnet
Gas heater and cooker.....W. Akin
Gas-meter, Rotary.....T. Thorp
Gas-producer.....P. G. Schmidt
Gas trap, Sewer-.....F. E. Cudell
Gear, Chain driving-...E. F. Morse. (Reissue.)
Gearing.....A. T. Brown
Gearing, Friction transmission-....C. M. Leech
Gearing, Power-transmission.....G. Milner
Glass-cutting machine.....W. H. Hanson
Glass-making machine.....C. N. Edmonds
Glycerin, Distilling.....F. J. Wood
Gold-bearing deposits from river-beds, Apparatus for elevating.....A. L. and O. H. Eliel
Governor attachment.....J. E. McDaniel
Grain and hay loader.....C. B. Sanrope
Grain-door, Sectional.....F. M. Reed
Grain-drill shoe.....R. Cole
Grain thresher and separator...H. R. Robinson
Grapple.....J. A. Holmberg
Grass digger, Quack-.....C. D. Brackelsberg
Grate.....J. A. Marquette
Grease-cup, Automatic.....O. Allen
Grinding and polishing machine.....F. N. and F. E. Gardner
Grinding-machine.....B. M. W. Hanson
Grinding machine, Cutlery-..W. J. Bastian et al
Grinding machine, Hay-.....J. F. Langdon
Grinding or abrading wheel.....E. F. Landis
Grip, Spring hand-.....S. A. Alden
Gun-sight.....D. L. Roscoe
Guns, Charging device for tubular-magazine...A. F. Laudensack
Hair-dressing device.....J. W. Hunter
Hame-fastener.....S. Varney
Hand lifting device.....G. Keller
Harvester bundle-carrying attachment.....A. Anderson
Hat and coat hook.....C. J. Ericson
Hay-press.....G. E. Warren
Hay-rake.....A. E. Feltham
Head-band, Remedial.....C. C. Dieudonné
Heating apparatus, Hot-water.....O. Oster
Heating-furnace.....J. L. McDonald
Heating systems, Water-intake valve and safety device for hot-water.....G. C. Andrews
Hoist, Fluid-pressure.....E. D. Smith
Hoist with adjustable counterweight, Counterbalance-.....W. van Wie
Hoop.....H. B. Chamberlain
Horseshoe-calk-sharpening machine.....W. E. Everitt
Hose, Metallic.....E. Witzenmann
Huller and kraut-cutter, Combined.....S. M. Stephens
Illuminating device and adjustahle supporting means therefor.....R. M. Jackson
Imitation house.....F. A. Stecher
Insulator, Protected.....J. H. B. Rea
Iron and steel, Charge for use in treating.....M. L. Bricker
Iron or steel to spike, nut, or bolt machines, Device for feeding.....W. H. Luden
Ironing-board.....G. W. Parrish
Jars, Closure for preserving-.....C. Bader
Keg, barrel, and similar receptacle..C. H. Mock
Knife attachment.....J. C. Holkestad
Knife-switch.....G. B. Thomas
Label-holder and pattern or parcel remover, Combined.....M. Frank
Ladder, Extension-.....M. M. Floyd
Ladders, Machine for making side rails of steps-.....J. C. Ludwig, Jr.
Lamp.....R. E. Bruckner
Lamp, Arc-.....R. Fleming
Lamp-hurner.....M. Savage
Lamp, Gas-.....W. J. Fry
Lamp holder, Incandescent-electric-..F. Walker
Lamp, Incandescent gas-.....D. F. Johnson
Lamp-jack.....T. H. Garland
Lamp socket, Electric-.....V. E. Extrom et al
Lamp tool, Incandescent-electric-..E. F. Dwyer
Lasting-machine.....W. O. Wheeler
Lathe.....R. C. Fay
Lawn-edger.....H. L. Carter
Leg, Artificial.....J. T. Apgar
Letter-box.....N. M. Cannady
Life-saving apparatus.....W. E. Peters
Lifting-jack.....G. E. Rider
Line-coupling, Train-.....W. L. Bliss
Liquid-cooling device.....T. E. Fry
Liquid-measuring faucet.....F. Kenney
Liquids from ores or other substances, Apparatus for extracting.....E. P. Lynch
Loader.....H. Ganong
Loading apparatus.....W. Baker
Loading machinery.....C. W. Andrews
Locomotive electric alarm system....G. Noreau
Loom weft-clamping device.....A. Baldwin
Lubricator.....J. C. Hill
Lubricator.....C. D. Paine
Manure-receiving attachment.....J. Harrigan
Mat.....W. M. Wattie
Match box and scratcher, Combined.....F. W. Van Slyck
Match-safe.....H. V. Delger
Match-safe and cigar-cutter, Combined.....J. Cassie et al
Message-holder.....D. Cosby
Metal body and producing same, Compound...J. F. Monnot
Metal coating.....G. H. Clamer
Metal objects, Process and apparatus for producing compound.....J. F. Monnot
Metal-plate-edging machine.....J. Fraser et al
Metal-shears.....L. E. Rice
Metals upon and in combination with metals or metal articles, Depositing...F. W. Gauntlett
Metallic-tie and track fastener.....F. M. Webb
Milling-machine.....J. Riddell
Minerals, Apparatus for washing or extracting.....R. Freygang
Mold or centering device.....J. E. Dooley
Molding-machine.....W. C. Swift
Molding-machine.....P. Bonvillain et al
Motor.....M. Logar
Motor-controller.....F. P. Townsend
Motor-controlling device.....C. E. Carpenter
Motor-controlling rheostat.....W. C. Yates
Motor for oil-pumps, &c.....W. S. Sherman
Multiple mold.....F. H. Seidel
Musical-instrument regulator....W. B. Fleming
Nailing machine, Shingle-band-....J. E. Elwing
Napkin-holder.....C. E. Smith
Neckband-shaper.....L. A. Mapel
Necktie attachment.....L. Kirseh
Nut-lock.....W. Peters et al
Order holder, Manifold-..E. A. Trommald et al
Ore-feeder.....T. M. Topp
Ores, Furnace for the reduction of.....G. F. Rendall
Organ, Portable reed-...W. J. and N. Kiessling
Oven.....E. Woollett
Oven, Bake-.....J. Faulds
Overgaiter.....C. H. Olander
Oxids, Reduction of refractory....K. A. Kühne
Packing, Metallic stuffing-box.....R. Bömcke
Pan-lifter.....D. S. Gossett
Paper-pulp-testing apparatus....P. Klemm et al
Parachute, Toy.....J. H. Thorpe
Parcel-button.....F. A. Wilkendorf
Parrot-stand.....O. Lindeman
Pastry-cone trimmer.....O. Hauge
Pattern and stripping plates, Making.....P. Bonvillain et al
Peeling-machine.....H. Hahn
Pelts, Machine for treatment of..M. Whitlateh
Pen, &c., clip, Fountain-.....J. Blair
Pencils, Machine for printing...W. H. Johnson
Photo-exposure meter.....S. Pratt
Photographic enlarging apparatus...M. Schütze
Photographic-film package, Flat-form.....A. J. Finkle
Photographic printer, Automatic..W. Fitterling
Pine-oil, pine-tar oil, and wood tar-oil, Purifying-.....O. P. Pellnitz
Pipe.....F. A. Dunn et al
Pipe-coupling.....W. H. Stoddard
Pipe coupling, Train-.....G. E. Kelly et al
Pipe mouthpiece, Suction-.....J. Markman
Pitchfork attachment.....C. A. Duprey
Planing-machine cutter-head.....H. A. Perkins et al
Plant-sprinkling apparatus.....J. W. Lischer
Plastic covering on floors, Machine for leveling.....M. Lischke
Platen-press paper-feed guide.....H. H. Strait
Plow harrow attachment.....J. F. Barbee
Plow, Rotary.....P. F. Landphere
Poison-indicator.....J. B. Smith
Potato-diggers, Hanger for the leading wheels of.....L. Willis
Poultry watering device.....J. G. Becker
Powder, Blasting-.....W. Eberle
Power-generating system.....H. Lemp
Pressure-controlled regulator....J. T. Weitbrec
Printing-plate holder or bed spacer.....C. F. Rockstroh
Printing-press.....A. E. Dowell
Printing-press.....D. W. Custer
Pulley-block, Separable...J. K. Voorhees et al
Pulp-press, Automatic.....K. A. Torsen
Pulverizer.....W. H. Hess
Pump.....I. E. Smith
Pump.....A. J. Adamson
Pump.....T. T. Graser
Pumps, Measuring device for fluid-.....W. J. Bussinger
Punching-machine.....A. Holmgren
Punctographic writing, Apparatus for embossing.....W. B. Wait
Radiators, Portable press for assembling.....G. H. Ray
Rail-brace.....E. M. Smith
Rail fastening or chair.....C. J. Nogle et al
Rail-joint.....L. Johnston
Rail point, Guard-.....W. R. Chedester
Rail, Shift-.....G. H. Sargent
Railway-signal.....W. H. Jordan et al
Railway signal system.....C. E. Duffie
Railway signaling.....L. M. Bracewell
Railway snow-plow.....O. F. Files
Railway-spike.....E. L. Eastling
Railway-switch.....G. W. Boon
Railway-tie.....E. F. Robinson
Railway-tie.....C. O. Benton
Railway-tie and clamp.....D. S. Beach
Railway-track brace.....W. D. Kelly
Rake.....J. Horn

Rake-tooth point....O. F. Orndoff
Ratchet mechanism, Double-acting friction....A. P. Brush
Razor-blade holder, Safety-....G. Toborg
Razor, Safety-....J. H. Flagg
Registering-machine keyboard mechanism, 2 pats....T. Carroll
Regulator....W. F. Krichbaum
Regulator for producers....P. G. Schmidt
Respiratory apparatus....E. E. Zerkle
Rheostat....W. C. Yates
Road-drag....W. A. Traver
Road-grader....L. Ireland
Rock-drilling machines, Distributing-valve for percussive....A. J. Bant et al
Roll ejecting device, Cutting-....E. G. Staude
Roof-edging....M. Moyer
Rosette....J. S. Stewart
Rotary engine....J. Matthews et al
Rotary engine....F. W. Remer
Rotary engine....F. A. Cleveland
Rubber articles, Making hollow...F. J. Gleason
Ruling mechanism....D. W. Custer
Sash-holder, Gravity....S. D. and L. E. Case
Sash-lock....H. K. Hillon
Saw gummer and sharpener..J. H. Loughridge
Sawing-machine, Portable....J. O'Hara
Scale compensating-rod connection..J. L. Good
Scraper, Wheeled....T. H. Stagg et al
Screen, 2 pats....A. Ganzel
Screen adjustable frame, Table-....S. Crocker
Sewing-machine cabinet....T. Kundtz et al
Sewing-machine feeding mechanism, Hat-sweat-....C. A. Dearborn
Shade and curtain bracket....W. G. Keller
Shade and curtain bracket, Window....F. Washburn
Shade and curtain hanger....S. O. Dougherty
Shaft, Flexible....E. C. Oliver
Shaft-hanger....C. W. Levalley
Shaper attachment, Draw-cut-....H. E. Morton
Shears....H. Melchior
Sheet-metal disinfectant cabinet or holder....E. W. Carnes
Shelving....J. E. Bales
Ship-cleaning apparatus....W. B. Bust
Shock-loader....J. W. Mueller
Shock-loader....J. B. Schuman
Shoe-lace guard and cover....F. M. Peters
Shoe-shining apparatus....C. W. Schell
Shoe tree or form....G. W. Whaley
Shotguns, Rear sight for....I. N. Lake
Shutter-operator....A. Weber
Sifter, Cinder-....O. R. Durrant et al
Signal-blower, Adjustable....E. O. Lawton
Siphon....J. Frueh
Skirt-measuring device, Dressmaker's....M. Putney
Skirt-supporter....A. W. Mader
Slack-adjuster, Automatic....C. O. Anderson
Slicing device....J. J. Kaschibufske
Slicing-machine....J. F. Nelsen
Smoke-consuming furnace....D. C. Walmsley
Smoking-pipe....R. L. Hustis
Soap-making apparatus....A. H. Pritchard
Speed-indicator....D. Miller
Spinning and twisting machine thread-board and thread-guide support....H. G. Beede
Spinning and twisting machine thread-guide....J. E. Prest
Spinning-machine....T. A. Harrington et al
Spring-wheel....A. Larson
Stacker....E. A. Keesling
Stamp-distributing device....H. Barry
Stamp-pad and treating the same....J. F. Sellcck, Jr.
Staple-puller....C. W. Cochran
Stay-strip....J. R. Carter
Stereoscope, Knockdown....H. E. Richmond
Store-service apparatus....C. J. Miller
Stove, Heating....C. W. Baker
Stove or range, Gas....W. A. Mills
Stove, Vapor-, 2 pats....G. E. Savage et al
Stoves, Making bottom cleats on..W. E. Wood
Stoves, ranges, &c., Oven-door for....W. G. Moore
Street-sweeper....O. Schumann
Street-sweeping machine....C. H. Butler
Sugar-cane and similar substances, Treating....G. D. Burton
Sugar, Producing....M. Altolaguirre et al
Supporting device, Extensible....E. A. Clark
Suspensory....E. A. Schmertz
Swing....W. Johnson
Talking-machine....T. Kraemer
Talking-machine attachment....H. F. Wittig
Telegraph transmitter, Wireless....C. P. Steinmetz
Telegraphy....T. A. Edison
Telephone attachment....J. C. Fox
Telephone-receiver....H. R. Stuart
Telephone sanitary shield....O. H. Hudgen
Telephone system, Anti-induction....W. Condon et al
Telephone system anti-induction method....W. Condon et al
Telephone system, Three-wire....W. Reid
Telescope-lens adapter....A. C. Young
Temperature-regulating apparatus...A. M. Butz
Terret-bur holder....E. Wesp
Testing apparatus....F. Schreidt
Thawing-point....A. H. Hakes
Thread-winding mechanism....E. Pohl
Ticket-holder....J. J. Walsh
Tire, Non-puncturable pneumatic..E. A. Storey
Tire outer cover, Pneumatic-....P. L. Desprez
Tire, Pneumatic....C. E. W. Woodward
Tire protector, Pneumatic-....J. O. Getz
Tire, Single-tube pneumatic....J. A. Swinehart
Tire, Wheel-....R. F. Bryant
Toilet-cover....E. Goddard
Tongue for farm implements....A. W. Mader
Tool, Compound....J. N. Ramstad
Tooth and blade cutter, High-speed....J. Lehmann
Track-fastening....H. C. Stickel
Track-straightener....M. E. Loehr
Traction apparatus for field operations....S. C. McCandless
Traction-coupling....M. J. Todd
Train-stop, Automatic....H. W. Wilson et al
Trap....J. M. Hendrix
Trolley....W. J. Baker
Trolley, Overhead....J. H. Howard
Trolley-wheel....L. J. Tetlow
Trolley-wire support....C. G. Ette
Truck, Hand-....I. L. Davenport
Truck or wagon, Railway....M. Lambert
Truss....W. Lennox
Truss....R. R. McGregor
Tube....P. J. Grouvelle et al
Tug and trace fastener..A. V. Cunningham, Sr.
Turbine....A. Petticore
Turbine automatic brake, Elastic-fluid-....O. Junggren
Turbine bucket, Elastic-fluid-....S. A. Moss
Turbine, Elastic-fluid....E. J. Berg
Turbine, Elastic-fluid....J. G. Callan
Turbine, Elastic-fluid....G. Belluzzo
Turbine, Elastic-fluid....O. Junggren
Turbines, Driving gas or gas-and-steam....H. Schmick
Turbo-blower....A. L. Wolfson
Turbo-generator....E. J. Berg
Type-writer platen-shift mechanism....G. A. Smith
Type-writing machine....J. C. McLaughlin
Umbrella....W. H. Taylor
Umbrella, Folding....A. Daun
Undershirt and similar garment....M. Saldin
Universal support....J. F. Snow
Valises and bags, Auxiliary handle for....C. M. Shaw
Valve....D. M. Stott
Valve....W. G. Benninghoff
Valve and lubricator, Combined throttle-....E. H. Lunken
Valve and lubricator, Combined throttle-....J. J. Aull
Valve, Balance-....B. F. O'Bryant
Valve controller, Radiator-....F. A. Simonds
Valve for faucets, Automatic check-....H. F. Mikesch et al
Valve for gas-burners....F. Egge
Valve for pneumatic hammers, Throttle-....R. A. Norling
Valve, Hydraulic....E. W. Marshall
Valve mechanism for rock-drills, &c....J. L. Mitchell
Valve, Plug-....J. E. Noesen
Valve, Safety-....E. E. Gold
Valve, Seat-actuated flushing-....D. W. McNeil
Valve, Stop and waste....D. C. Charmois
Valve, Throttle-....W. J. Haskill
Vapor burner, Hydrocarbon-....W. J. Fry
Vegetable-cutting machine....F. Wind
Vehicle-brake....A. Godfrey
Vehicle brake-shoe and holder..T. J. Tubb et al
Vehicle controlling device, Motor-....T. L. and T. J. Sturtevant
Vehicle, Folding....E. Gundelach
Vehicle steering device, Motor-....D. Roberts et al
Vehicle-tire....J. F. Wilmot
Vehicle-tire....E. Knowles
Vehicle-tire-filling compound...J. F. West et al
Vehicle transmission-gearing..L. A. Fraver et al
Vehicle-wheel....N. E. Meredith
Vehicle-wheel....C. E. Harris
Vehicle-wheel sled-runner....J. Karssen
Vending-machine....S. M. Stroock
Vending-machine....C. C. Travis
Vending-machine casing....C. R. Pope
Ventilator....T. Lee
Voting-machine....F. Keiper
Wagon and other receptacle, Railway-....R. G. Sharp et al
Washboard....S. W. Wigner
Washing-machine cylinder....C. Jensen
Water-closet flush-tank....C. E. Thompson
Water-heater....L. C. Lewis
Water softening and purifying apparatus....H. H. Sutro et al
Wave-power....L. Wolfley
Weather-strip....G. Gallup
Well-bucket holder....W. T. Laughlin
Well-drilling machine....J. G. Russell
Welt-skiving machine....E. E. Winkley
Wheel....I. Tenkinson
Wheel-lock....W. W. Jones
Whip, &c., case....N. F. Alston
Whip-socket....W. B. McMasters
Whip-socket, Locking....C. W. Mayhugh
Wind-indicating device for practice-shooting...C. B. Winder
Wire-connector....J. M. Sahlin
Wire-stretcher....L. G. Thornton
Wooden post....I. Carpenter
Wrench....F. Hachmann

DESIGNS.

Automobile-horn....E. Rubes
Bottle, Poison-....A. J. Iwan
Door-knob....C. H. Herrick
Emblem....L. H. Morgan
Horns, Case for moving parts of mechanically-actuated diaphragm-....M. R. Hutchison
Horns, Resonator and case for mechanically-actuated diaphragm-....M. R. Hutchison
Jar....S. S. Marvin
Lamp-shade....I. A. Whaley
Lock-trimming....C. H. Herrick
Rug....E. G. Sauer
Scale pointer, Weighing-....G. Walker
Sheet-metal caddy-body blank....L. J. Freundt
Soap-dish....J. P. Eustis
Spoon, fork, or similar article....S. Stohr
Tongs member....F. S. Hyatt
Toy casing, Mechanical-....R. S. Bauer
Toy figure....A. Schoenhut

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MECHANICAL PATENTS.

Adding-machine....J. G. Vincent
Adding-machine attachment....A. Pentecost
Adding-machine handle connection....W. H. Pike, Jr.
Adjustable seat....T. J. Dentz
Advertising-sign....L. H. Deaner
Aerial navigating apparatus....J. Bernard
Agricultural implement....M. Konter
Air from steam-heating installations, Apparatus for withdrawing the....A. Scholl
Air, Method of and apparatus for drying....H. C. Gardner
Air-ship....P. Hochstrasser
Alarm system....W. H. Kirnan
Alkalies, Making caustic....W. T. Gibbs
Alloys, Making titanium....F. M. Becket
Ambulance....I. H. Russell
Amusement device....H. A. Thompson et al
Animal-slaughtering instrument....H. Bergh
Annealing-box, 2 pats....F. Cordes
Audiphone-transmitter....C. E. Williams
Automobile....N. M. Anderson
Automobile transmission device...T. Williams
Ax....H. Yeatts
Ax-handle lathes, Variable feed for....J. A. Cummins
Baling-press....H. M. Tallman
Bank or safe, Child's coin....W. A. Ludeke
Barrel-head turner....V. J. Houlihan
Basket-ball device, Toy....S. J. Hartnell
Battery connector attachment....J. F. Siems
Bearing, Suspension-....R. J. Bustillo y Diego
Beating engine, Paper-....L. Jorgensen
Bed, Folding wall-....J. H. Edmonds
Beet-dump transfer appliance....F. L. Pickett
Billing-board, Manifold....P. Hano
Bin indicating device....P. Swanson
Binder, Loose-leaf....J. L. McMillan
Binder, Loose-leaf....O. H. Schraeger
Block-signal....C. H. Roth et al
Block-signal system, Electric....P. J. Simmen
Boiler....J. W. H. Handley et al
Boiler automatic feed device, Steam-....B. Simonides
Boiler-cleaner....H. C. Fabri
Boiler-stand....G. O. Miller
Boll-weevil-exterminating device....A. J. Mahanay
Book-leaves, Machine for crimping....J. Dahly
Books, magazines, pamphlets, &c., Machine for creasing covers for....J. Dahly
Boots and shoes, Toe-box for use in the manufacture of....J. H. Brown
Bottle and other vessel....J. H. Hunter et al
Bottle-washing apparatus....G. Truesdell
Bottles or other vessels, Closing device for....J. E. Fagerström et al
Box-hanger and ground-clamp, Combined....S. Adelman
Box-packing machine, Stuffing-...R. R. Stirling
Brake....M. Lingenfelter
Brake mechanism....G. S. Ackley
Brake-shoe....R. L. Brown
Braking or signaling system, Automatic....F. H. Shepard
Brick-mold....C. S. Wert
Brick molding and pressing machine....O. M. Reif
Bridle, Safety-....H. P. Mattson
Brush, Tooth-....A. M. Stryker
Buckle, Cross-line....W. R. Smith
Building-block, Reinforced molded....G. A. Peterson
Bundle-carrier....J. Trotter
Bundle-tying device....F. E. Spears
Bushing....H. J. Gilbert
Button-blank conveying and distributing machine....I. De Francisci
Cabinet, Corn-testing....C. B. Joslin
Cabinet, Rural-free-delivery....W. A. Tomison
Cake-coating machine....P. D. Harton
Calculating-machine attachment...T. J. Falvey
Camera....B. O. Walker
Camera focusing attachment....W. F. Folmer
Candle, Spark-emitting....F. J. Welter
Caoutchouc, Manufacturing solutions of....E. Fischer
Cap, Washable....K. Neidhart
Car-axle-box lid....F. Hachmann
Car-brake....C. B. Fairchild
Car changeable sign, Street-....R. L. Halleman
Car-coupling....O. Hecathorn
Car-doors, Means for operating and locking...J. G. Horazdovsky
Car, Dumping and loading....G. C. Wortman
Car-fender....F. A. Nelson
Car, Poultry-....W. M. Ryan et al
Carcass-splitting machine....W. B. Wallwork
Carpet-stretcher....M. A. Smith
Cartridge for mining purposes....E. and S. Purcell
Casing-head....C. A. Waitz
Chair fan, Rocking-....J. Duaster
Change-delivering means....E. B. Gallaher. (Reissue.)
Chemical compounds, Manufacturing....C. F. Carrier, Jr.
Chronometric baby-tender...S. F. Wilson et al
Chuck....A. I. Jacobs
Cigar-press....N. Weiss
Circuit-controlling device....H. Geisenhöner
Cistern cut-off....A. Fink
Clothes-line reel....T. Scally
Coin-holder....E. S. Bell
Collar-fastener, Adjustable....J. A. Ward, Jr.
Combs of combing-machines, Device for positioning pins for the....T. Townsend
Concrete-building-construction mold....E. J. Drayer
Concrete floor construction....F. C. Taxis
Concrete pipes, Apparatus for laying....E. L. Ransome
Concrete pipes, Method and apparatus for molding....E. L. Ransome
Concrete post, Reinforced....J. Needs
Concrete supporting-beam, Reinforced....J. Needs
Concrete-wall mold....W. E. Turkington
Conduit, Resilient flexible....U. S. Armstrong
Control system....E. W. Stull
Control system, Multiple-voltage..R. P. Jackson
Controller....J. F. Menningen
Copy-holder....C. F. Stehlin
Core, Winding-....J. H. Gately
Cork-extractor....C. M. King
Cork-puller and time-indicator, Combined....K. E. Parker
Corn-gatherer....S. J. McNaughton
Cotton-gin....C. C. Epps
Cotton-gin....R. B. Lumpkin
Crate....A. G. Felker
Crate....B. F. Ferguson
Cream-ripener and like machine...J. T. Hanna
Crystals, Manufacture of large....J. Bock
Cultivator replanting attachment...E. D. Beers
Curtain-roller....T. Digney
Cut-off, Automatic....J. Miller et al
Davenport or couch, Folding....J. M. Kiefer
Dental swaging apparatus....H. B. Zendel
Derailer....R. Hamilton
Derailing device, Safety....F. Pélissier
Dinitroglycerin explosive and making....A. Mikolajczak
Diseases, Apparatus for magnetic treatment of....R. S. Clymer
Dispensing-container....W. A. Kirkpatrick
Display apparatus....W. F. Allert
Display box, Papcterie-....C. H. Weaver
Display-stand....G. R. Ford
Ditcher and [illegible]....J. O. [illegible]
Ditching-machine....[illegible]
Door check and closer bracket....J. H. [illegible]
Door-hinge....L. W. Harris
Door lock, Sliding-....G. M. [illegible]
Door-retainer....C. S. Hendrix
Draft-rigging....W. C. Hendrys
Drill....W. L. Harbert
Dry-placer machine or concentrator....H. P. Curtis
Drying apparatus....R. Peterson
Dynamo-electric machines, Regulating of....A. F. Dessau
Eating utensil, Hygienic....C. M. [illegible]
Electric apparatus....R. C. [illegible]
Electric carrier system....S. C. [illegible]
Electric furnace, 2 pats....J. H. [illegible]
Electric heater....G. H. Hill
Electric hoist....W. O. Derthy
Electric-light shade....T. Smith
Electric meter....R. C. Lanphier
Electric recording instrument....L. T. Robinson
Electric speedometer and odometer....H. Bonbright
Electric switch....B. W. Macy
Electric-terminal clip....G. McIntyre
Electric-wire cleat....A. L. Vickers
Electrical generators, Automatic tension-regulator for....A. Nicol
Electrical indicating instrument....R. C. Lanphier
Electromagnetic stamp-battery....J. P. Lynn
Elevator-door automatic check and release mechanism....K. S. Evans
Engine electric-circuit controller, Internal-combustion-....C. Cuno
Engine fuel-injecting nozzle, Internal-combustion-....K. J. E. Hesselman
Engine valve-gearing, Explosion-....R. Hennig
Engine vaporizer, Internal-combustion-....K. J. E. Hesselman
Engine vaporizing apparatus, Liquid-fuel internal-combustion-....H. B. Krijthe
Envelop....J. R. Ritchie
Envelop-fastener....J. Crooks
Envelop, Safety-....A. B. Knowlton
Esters, Making isobornyl....C. Weizmann
Excavating-machine....C. H. Ruth
Excavator controlling mechanism....J. B. Webber, Jr.
Explosive and making the same...A. La Motte
Extender and recliner, Combination automatic....W. G. Classen
Eyelet....F. H. Richards
Fan deflector, Electric-....M. M. Wood
Faucet....J. J. Fitzgibbon et al
Feed-bag supporter....J. E. Colgan
Fence....J. L. Noll
File-indicator, Duplicate-sales-slip....M. A. Lumbard
Filling-moistening apparatus....H. F. Straw
Filter....A. T. Peirce
Fire-extinguisher with double nozzle, Chemical....C. Graaff
Flask-clamp....J. H. Jones
Flood-gate, Automatic....O. Olson
Floor or like construction....H. N. Wilson
Floor or wall, Tiled....A. C. Eggers
Floor-surfacing machine....J. B. Dyer
Floors, Composition of matter for polishing and dressing....I. H. Peco
Flower-pot support for jardinieres..J. Clements
Flying-machine....H. Bea
Folding chair....D. W. Hook
Furnace-arch....F. Girtanner
Furnace-door frame, 2 pats....L. L. Knox
Furnace-door-frame guard or fender....L. L. Knox
Furnace-grate....R. Allen
Fuse, Percussion-....C. Puff
Garment....G. A. Baumann
Garment adjuster and fastener, Combined....W. W. Lowrie
Garment-clasp....H. H. Taylor
Garment-hook eye....L. A. Yeiser
Gas-generator....M. Kennedy
Gas generator, Acetylene-....J. F. Hoffman
Gas-light fixture....J. Maas
Gas lighting and extinguishing apparatus....O. H. Hinds
Gas-syringe with branched-out discharge-pipe...K. Schmidt
Gas-water-heater drip-cup....J. R. Donnelly
Gate-operating mechanism....J. E. Buckman
Gearing....G. F. Press et al
Girder....E. A. Moccetti
Glass and dish cleaner....W. S. Callery
Grader, Adjustable road-....J. H. Koontz
Grain-separator....C. A. Torrence
Graphophone....T. P. Hall
Grinding-machine....A. E. Ayer
Grinding-mill, Ball....C. E. Wyman
Gun-carriages to the ground, Anchoring wheeled....J. A. Deport
Gun projectile, Rifled-....P. B. Meyer
Guns having recoiling barrels, Braking mechanism for....K. Völler
Hair-pin....A. G. Needs
Hand-bag, &c....T. R. Weidemann
Hand-bag....C. T. Slade
Handle....J. O. Davison
Handle for removable closures for receptacles..A. H. S. Swan
Harness-connector....C. A. Jacky et al
Harness-hanger....J. A. Pierson
Harness pneumatic pad....J. M. Kelly et al
Harrow....S. F. Horner
Hay-press....M. D. Guthrie
Heating device, Electric....A. E. Reimers
Hoisting-hook....E. Stretch
Hook and eye....W. M. Corthell
Hose on mandrels, Machine for mounting....S. J. Sill
Hydrazin, Production of....F. Raschig
Ice-cream freezer....J. R. Fitzhugh
Index-center, Multiple-spindle....E. P. Miller
Indigo-white and making same, Stable....R. Wimmer
Insulated rail-joint....J. MacMartin
Insulating compound....P. J. Cannon et al
Insulator-pin....S. J. Edmiston
Intermittent coupling, Automatic....C. Trog
Ironing-board....A. Paradis
Ironing-table, Folding....J. P. Ruth
Journal-brasses, Device for raising....G. W. Leavitt
Key-seating attachment....A. R. Murray
Ladder bracket....L. T. Burns

Ladle machinery....C. W. Aveling
Lamp and making the same, Electric, 2 pats....C. P. Steinmetz
Lamp, Arc-....C. A. B. Halvorson, Jr.
Lamp-chimney holder....T. Murphy
Lamp, Inverted gas-....F. M. Brooks
Lamps, System of lighting by arc-..R. Fleming
Lantern, 2 pats....W. S. Hamm
Lantern....L. Herman
Lantern....J. A. Mosher
Lantern-burner....W. S. Hamm
Leaves, Apparatus for turning over....J. Beveridge
Letter-box support....G. G. Wallace et al
Lima or analogous petroleum and related oils, Desulfurizing....C. I. Robinson
Linotype-machine trimming mechanism....J. E. Billington et al
Loading device, Tramway....C. A. Case
Locomotive-economizer....W. Wiley
Loom, Circular....C. Thibodeau
Loom picker-check....W. H. Pierce et al
Loom wrap stop-motion....G. M. Foster
Lubricator....C. D. Schroeder
Machine-tool holder....M. S. Cummer et al
Magnet or the like, Field-....C. P. Bary
Magnetic separator....C. M. Green
Mail-bags, &c., Apparatus for catching and delivering....B. L. Toquet
Mail-box....A. A. Kellogg
Mail-catcher....W. Sears
Mailing-tube....W. A. Seymour
Material-handling apparatus....H. W. Blaisdell
Mats, carpets, &c., Device for holding down....W. T. Milward
Measuring device, Powder-....A. A. Rickert
Measuring instrument....H. Darwin
Mechanical movement....A. W. Redin
Medical electrical device for medical and therapeutical purposes....F. A. Ligowsky
Metal bodies, Producing compound....J. F. Monnot
Metal salts, Forming....W. H. Allen
Metals, Covering....C. Hellmich
Metallic wires against oxidation, &c., Protecting....W. Hancock
Meter fitting, Water-....H. I. Dilts
Milk, Desiccating....J. H. and C. H. Campbell
Mill sieve, Fanning-....T. Chipera
Mine or projectile, Explosive....T. G. F. McCombie
Mines or projectiles, Fuse in connection with explosive....T. G. F. McCombie
Mining-machine....E. McGowan
Mirror, Hat-....M. Rawitsch
Mold....H. Lammon et al
Molding apparatus....H. L. Demmler
Molding apparatus, Gravity....D. Parks
Molding-machine....J. Butler
Mop-wringer....G. Brenner
Motor automatic starting device, Electric-....I. Hansen
Motor-control system....H. D. James
Motor controller, Electric-....W. A. Paris
Motor-meter for alternating currents....R. C. Lanphier et al
Motor meter, Mercury-....R. C. Lanphier et al
Motor-starter, Automatic....W. C. Yates
Motor system, Alternating-current-....C. S. Bradley
Musical-instrument coin-ejector....W. E. Cleveland
Needle-operating mechanism, Circular-....J. Larsen
Nest-box for hens....A. K. Bakken
Numbering-machine....F. Sander
Nut-lock....C. H. Garfield
Nut-lock....D. I. Griffith
Nut-lock....G. Hardin
Nut-lock....M. C. McCoy
Nut-lock....W. E. Pounds
Nut-slotting machine....A. L. Mowry
Nut-stand, Revolving....F. N. Robinson
Ore, Treating iron....C. B. Morgan
Organ-case, Folding....F. L. Caulkins et al
Oxids of nitrogen, Absorbing..B. F. Halvorsen
Padlock....F. Soley
Paper, Carbon-....W. L. West
Paper package....S. Wheeler, Jr.
Paper-serving apparatus....R. A. Watts
Paper-stock, Pulping and cleaning....J. D. Tompkins
Papers, Device for impressing seals on....F. Gottschalk
Pavement and constructing the same....J. A. Omberg, Jr.
Pavement, Removing asphalt....W. E. Kerns
Pen feed-bar, Fountain-....E. V. Whiton
Percussion-machine....W. Mauss
Permutation-lock....F. J. Burns
Photographic representations of structural designs, Producing....C. Clements
Piano....C. W. Zinco
Piano-player, Mechanical....H. T. Logan
Piano sounding-board....A. Krieghoff
Pipe into flat metal, Transforming scrap-....J. T. Horner
Pipe-joint, Flexible....C. H. Jenkins
Pipe-system testing-plug....J. Simon
Plane....W. L. Fischer
Planter attachment....J. K. DeJong
Planter marker, Corn-....D. Loudenslager
Plow....J. Buchanan
Plow....A. G. Erickson
Plow....O. Fischer
Plow-iron....L. R. Beach
Plow, Sulky-....G. Warner
Pocket-holder for hand-bags and similar receptacles....T. F. McMahon
Polishing machine, Felly-....O. Allen
Pool register, Pin-....N. A. Archibald
Post-mold....C. S. Wert
Potato-digger....W. Strait
Power-transmitting mechanism....F. Bucherer
Power-transmission gear....J. H. Williams
Press....J. A. Keyes
Printing machine, Blue-....C. De Lukacsevics
Printing-machine feeding and separating apparatus....M. H. Mann
Printing-press....J. T. Miller.
Printing-press ink-distributing device....R. Klucken
Printing-press numbering device..F. M. Turck
Printing-press, Rotary....F. M. Turck
Propeller, Reversing....O. A. Bowers
Pulley....H. J. Gilbert
Pump....E. K. Hood
Pump....C. W. Enos et al
Pump, Cleaning-....R. L. Dutton
Pumping apparatus....S. W. Edmiston
Rail guard-covering, Third-....E. M. Schollenberger
Rail-joint....G. A. Weber
Railway....J. J. Martin
Railway-air-brake safety hose-coupling..K. Ráth
Railway and vehicular device for purposes of amusement....P. Marshall et al
Railway-crossing....W. Corliss
Railway signaling mechanism....L. H. Craft
Railway-tie....G. S. Denglar
Railway-tie....R. H. Fishbaugh
Rake-tooth, Steel....W. Kouns
Rat-trap....C. M. Harrington
Razor-blade....E. E. Bennett
Razor-strop-, 2 pats....F. L. Pinney
Razor-strop....E. E. Deputy
Razor-stropping device....W. J. Miles, Jr.
Recording apparatus, Comparative..J. M. Boyle
Recording-gage....W. Young
Registering-machine driving mechanism....C. F. Kettering
Remailable box....H. W. Randall
Resistance....J. L. Dinsmoor
Resistance, Variable....E. Thomson
Rocker-ring, roller-bearing....R. Siegfried
Rolling-mill....O. Heer
Rubber hose, Machine for applying wrappers to....S. J. Sill
Ruler....L. Fox
Sash-fastener....P. Mulrooney
Sash-lock....H. H. Akers
Sash-lock....W. E. Petrie
Sash-lock....C. L. Gano
Sash ventilator, Window-....A. S. Meek
Saw-sharpener....T. Becker
Sawing-machine....J. J. Meyers
Scaffold-bracket....S. W. Shue
Scale, Automatic....E. W. Wray
Scale-pendulum....J. W. Culmer
Scalp-sprayer....W. B. Van Eps
Screw-punch, Ratchet....W. Butler
Seat attachment....H. H. Schott
Seat-fastener, Safety....J. A. Heintz
Secondary battery....H. F. Joel
Settee bed and couch, Combined...J. Phillipson
Shade and curtain-pole support....O. A. Wolfe et al
Shade-roller package, Unit....S. H. Leach
Shade support, Adjustable window-....N. Fleischaker
Shaft-tug and buckle, Combined....S. E. Winslow
Shaping-machine....A. R. Murray
Shears....J. M. Sweet et al
Shell for ordnance....C. Heldt
Shelving....B. L. Waters
Shipping case or crate....H. H. Buscher
Shipping case, Piano-....P. B. Dahl
Ships' boats, Apparatus for lowering....C. Smith
Shock-absorber....G. R. Rogers
Shock-absorber....T. Veitch
Shoe....J. M. and M. S. Hanson
Shoe and sandal, Combined....S. Borchardt
Shoe-fastening....A. Assorati
Shoe for runners....T. Corcoran
Shoe-polishing machine....E. F. Symonds et al
Show-case....S. Himmel
Signal-lantern....C. L. Betts
Sink, Kitchen-....T. Lydon
Skirt and coat fitting and turning device, Lady's....L. Curico
Slicing-machine....A. Barth
Soap-dish....T. C. Colton
Soap-press....J. A. Keyes
Speed transmission device, Variable-....J. R. Anderson
Spinning and doubling frames, &c., Apparatus applicable to ring....G. Mongne
Starch, Production of soluble....F. Fritsche
Steam-generator....G. A. Walton
Steaming-table....F. Yosi
Stethoscope....C. J. Pilling
Stockings, Knitting....J. Black
Storage battery, Electric....C. S. Cole
Storm-front cleaner....L. A. Wilson
Stove and the like....C. W. Smith
Stove, Gas-....A. B. Clunies
Stove, Gas-consuming heating-...W. C. Hilliker
Stove-lifter....R. H. Hall
Street-crossing....S. B. Minnich
Streets, roads, and other places, Machine for the formation of coverings on..J. E. Behmer
Strip, Parallel....W. B. Runbeck
Stump-pulling and stone-lifting device....O. F. Nelson
Suit-case frame....A. Peterson
Swing....G. Dittmar
Switch and signal operating lines, Multiple-unit deflecting-bar stand for....W. E. Foster
Switch-lock....H. M. Rice
Tape-moistener....F. E. Francis
Telephone-receiver....A. Stromberg
Telephone-receiver support....R. S. Griffith
Telephone ringing system for party-lines....C. A. Simpson
Telephone-service rent-collecting means....R. Ycarneau
Test-indicator....A. Montan
Thioindigo leuco compounds, Making....E. Münch
Threshing-machine mounting....E. R. Grams
Tie for packing-boxes....E. P. Lehmann
Tile sign....F. M. Ross et al
Time-recorder....A. W. M. Ewering
Tip-cat....J. F. Carey
Tool for removing eyes from vegetables....J. D. Houck
Tool, Impact-....C. B. Richards
Tool, Jeweler's....C. W. Pillars
Tool, Mortising-....F. C. Lehmann
Tool, Multiple....F. R. Cunningham
Tooth, Artificial....G. Sibley
Torpedo, Self-propelled....A. E. Jones
Track-sanding apparatus..F. L. Robinson et al
Train-shed....F. A. Berne
Travis-wheel....G. A. Crow
Trolley cut-out....F. M. Spaid et al
Trolley-head....W. E. Donnelly et al
Trough, Watering-....A. Moore
Truck, Rigger's....J. Ross
Truss....A. C. Cooke
Tube-cutter, Roller....A. P. Kohler
Tubular structure....L. Atwood
Tumbler-washer....L. L. Rowe
Tunneling-machine....C. A. Case
Turbine-engine, Gas....A. W. H. Griepe
Turn-table....J. J. Weaver
Type-writing machine, 2 pats....A. T. Brown
Type-writing machine....C. A. Joerissen
Valve....J. O'Connor
Valve....J. M. Beggs
Valve, Closet-....J. Ruhl
Valve, Engine-....J. F. Hopper
Valve for aerated beverages, Regulating-....J. H. A. Garmen et al
Valve relief mechanism, Piston-..J. A. Pfeiffer
Valve, Safety-....H. C. McCarty
Valve, Tank-....H. Sinclair
Vaporizer for liquid combustibles....E. Hubert
Vegetable butter capable of being spread....P. Kolesch
Vegetable-cutter....R. L. Dorsey
Vehicle-axle....D. Davis
Vehicle-brake....J. C. McNees
Vehicle compensating elastic suspension device....R. Bonnevie
Vehicle-coupling....J. Sieh
Vehicle-wheel....G. Vinet
Vehicle-wheel rim, 3 pats....E. C. Shaw
Vehicle wind-shield....J. V. Laddey
Vehicles, Guard or screen for motor road-....O. T. Banks
Vending apparatus, Liquid-, 2 pats....F. Turner
Vending device, Coin-actuated....M. Stoltz
Vending-machine....C. A. Dies
Vending-machine, Coin-controlled....M. Stoltz
Vending-machine, Coin-controlled..E. H. Cook
Vending-machines, Case for coin-controlled....E. H. Cook
Vending-machines, &c., Fastening means for coin-actuated....M. Stoltz
Ventilator....L. D. Pratt
Vessel indicator, Invertible-....J. Lightfoot
Vessel self-leveling mechanism, Maritime-....F. G. Cory
Vibratory apparatus for therapeutic use....J. C. Johansen
Wagon-brake....G. Ennis
Wagon-tongue support....F. Trost
Warping-machine....R. Whitley
Washing device for cleaning wounds....J. Reusch
Washing-machine....C. A. Pettersen
Water, Means for the purification of....D. L. V. Browne
Well mechanism....M. E. Layne
Whiffletree and trace connection....G. A. Crow
Windmill....A. Macris
Window construction....N. Poulson
Window-pane joint....N. Fells
Window-screen....J. H. Cornelison
Window-screen fly-trap....C. E. Bowen
Wire-stretcher....T. M. McKenzie
Wood-impregnating apparatus....E. Koepfer
Wrench....G. W. Stenz
Wrench....J. F. Wright
Wrench....R. A. Ryrie

DESIGNS.

Casing for mechanical whistles or sirens....J. Gordon, Jr.
Cock, Pantry-....H. Mueller
Emblem....M. J. Heller
Fabric, Textile....P. Scheidecker
Hat, Woman's....M. U. Metzger
Lamp, Gasolene-....O. A. Arneson
Organ or piano case....J. P. Tobin
Pipe....D. N. Hyman

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MECHANICAL PATENTS.

Adding-machine....C. N. McFarland
Adhesive-applying apparatus....W. N. Moore
Advertising apparatus....A. S. Speigel
Air, Device for treating the human body with heated....D. Tyrnauer
Air-inlet and beer-outlet bung-hole apparatus..J. H. Flach et al
Alcohol from liquor casks or barrels, Recovering waste....A. Berg
Alkaline-earth cyanids, Saponification of....K. Bosch
Amusement device....J. W. McCann
Anchor, Land-....W. Jay
Annular burner....L. H. Brinkman
Atmospheric electricity, Apparatus for collecting....W. I. Pennock
Audiphone-transmitter....C. E. Williams
Automobile starting device..R. E. Drachenberg
Automobile steering-gear....G. Geer
Awning-fixture....F. Bailey
Ax, Detachable....J. Ryan
Baling-machine wire-tier....J. H. Gregory et al
Ballot-marking guide....L. A. Wilkinson
Ballot-pouch....N. Beman
Banana-carrier....A. Look
Band-stamp....A. H. Merrill
Banjo....I. Fillman
Bank check and draft system....B. E. Buckmaster
Barber's-chair reclining mechanism....E. E. Koken
Barber's pole....E. E. Koken
Bath-cabinet....T. Papworth
Battery plate, Storage-....E. W. Smith
Bearing, Friction-....C. J. Lang
Bed and sofa, Convertible....J. W. Campbell
Bed, Davenport-....G. A. Mellon
Bedstead....G. T. Bouslog
Bedstead-brace....R. H. Parker
Beer-cooler....J. D. Hendrix
Beet-topper....W. B. Baldwin
Bellows, Pumping-....R. W. Pain
Belt-clasp....C. W. Powell
Bench and chair, Combined....T. D. Montague
Bench-clamp....S. J. Chambers
Binder, Loose-leaf....R. Krumming
Binder, Temporary....H. Herdegen
Boiler....F. S. Bean
Boiler baffle, Water-tube-....L. Woerner
Boiler-flue cleaner....J. C. Ross
Boiler furnace, Steam-....G. A. Bu Miller
Boiler-sheets, Means for connecting flues to....S. W. Howell
Book-leaf....P. Hansen
Book, Loose-leaf....J. Griesinger
Boot or shoe....C. L. Blaisdell
Brake-shoe....W. B. Goodwin
Briquet-press....O. Zimmermann
Brooder, Chicken-....H. G. Hoops
Broom-head....H. V. Wilkins
Broom-moistener....T. Meyer
Buffing-machine....E. E. Perrers
Building-block mold....W. N. Box et al
Bung-cutting machine....C. W. Kineaid
Burial-vault door....F. S. Wisterman
Bust-supporter....E. A. Busby
Cabinet, Kitchen-....R. W. Ribley et al
Cable-grip....T. W. Tiley
Calcareous artificial-stone substances by means of carbonic acid, Hardening....E. Schwanenberg et al
Can-opener....A. M. Russell
Candy-cutter....C. D. Lane et al
Cap, 2 pats....I. Pachner
Car-bumper or the like..G. H. F. Sehrader et al
Car-coupling....W. S. Sehroeder
Car draft-gear, Railway-....H. M. Pflager
Car, Dumping-....R. G. Taylor
Car grain-door....B. F. Owens
Car hand-brake, Railway-....E. A. Barber
Car, Push-....G. C. Wortman
Car-seating....J. B. Kilburn
Car stake-holder, Logging and platform....W. T. Edney
Car-stop....J. T. Howell
Car understructure, Passenger-....J. F. Streib
Carbureter....A. J. Abel
Carbureter....F. H. Otis
Carbureter....A. Weiland
Card-holding stand, Revolving....E. C. Douglas
Card or paper holder....W. H. Berne
Card-take-up mechanism, Jacquard....J. A. Groebli
Carpet-stretcher....G. M. Seipel et al
Carrier....W. G. Beatty
Cart....T. E. Daly
Caster for tubular legs for furniture, 2 pats....A. B. Diss
Cattle-guard....J. L. Crouch
Chain, Sprocket-....G. M. Pierson
Chair and shoe-polishing cabinet, Combined....A. Soderling
Channeling and grooving knife....B. F. Mayo
Chart....J. G. Stites et al
Cheese-holding board....C. P. Mee
Cigar-moistener....J. H. Glatt
Cigarette or cigar box....A. Kochenthal et al
Clock, watch, &c., friction-spring..F. R. Alford
Closet-seat....D. A. Ebinger
Closure....W. R. Comings
Cloth-feeding attachment for tentering-machines....C. F. Gegenheimer
Cloth-treating apparatus....H. L. Gantt
Clothes-drier....A. W. Ringblom
Clutch, Friction-....F. J. Lemley
Coal-mines and other places, Respirating apparatus for use in....W. E. Garforth
Cock, Compression stop and waste....R. W. Beaton
Cock, Gage-....G. W. Collin
Coin detector for slot-machines, Spurious-....F. W. Klineman
Coin-holder....J. Fackenberg
Coin-holder, Decorated....C. S. Marsh
Coin receptacle and delivering device....A. E. Smith
Collapsible box....P. Henrich
Collar attachment....C. R. Current
Collar, Clamp-....J. H. Gately
Collar-supporter....J. A. Doran
Collector-ring and clamping-plate....C. H. Smoot et al
Combination-lock....H. M. McDonald
Controller....H. W. Cheney
Controller....H. C. Marmon
Controller and circuit-closer, Combined....D. C. Cookingham
Coop, Collapsible chicken-....R. E. Laidley
Cork-pulling device....C. C. Call
Corn-header....L. J., Jr., and F. R. Gehrmann
Cotton-chopper....J. A. Fuller
Cotton-gin rib....J. T. Fuller
Counting and bottling machine....W. H. Froggatt, Jr.
Crane, Adjustable counterbalance radius-....W. Van Wie
Crank-hanger....D. B. Stephenson
Crate, Knockdown....C. A. Smith
Creeper, Anti-rail-....G. S. Zahniser
Crucible-furnace....E. H. Schwartz
Cuff-attacher....J. L. Parker
Cultivator....W. L. Paul
Cultivator, Wheeled....G. N. Hypse
Curtain-fixture....C. F. Dawson
Curtain-pole....J. P. Reed
Cushion....E. G. Budd
Cylinder mold, Closed-....H. Brinker
Deformed bar....F. V. McMullin
Dental handpiece....R. M. Mayes
Dephlegmator....J. MacKaye
Desk attachment....M. L. Walters
Dish-washing machine....O. S. Lee
Disinfecting apparatus....W. H. Rose
Disk drill....C. H. Pelton
Dish holder or rest....P. Lier
Door-holder....G. L. Robinson et al
Door-operator....W. Harris
Door-lock and burglar-alarm, Combined....T. W. Smith
Door roller-support, Sliding-....D. C. Edmondson
Door-stop....F. D. Melvill
Doors of public buildings, Means for automatically opening....T. A. Stevenson et al
Doors of public buildings, Means for automatically unlocking, 2 pats..T. A. Stevenson
Drill disks or plows, Means for raising and lowering....W. E. Burks
Drill lubrication, Rock-...J. A. Thompson et al
Dye, Red mono-azo....E. Ulrichs
Dynamite-heater....A. H. Vannauker
Earth-excavator....H. W. King
Egg-carton....W. B. Le Bourgeois
Electric accumulators, Agglutinizing active material for....Q. Marino et al
Electric-battery holder and battery....G. L. Patterson
Electric irons, heating appliances, and the like, Contact-plug for....R. G. Pheysey
Electric-light bracket....W. Roessler
Electric machine, Dynamo-....H. A. Baleome
Electric relay....F. Townsend
Electric-terminal clip....W. E. Dow
Electric-wiring cleat....R. McLennan
Electrical wires, cables, and conduits, Connector for....R. W. Pittman
Elevator-controlling mechanism..F. E. Turner
Elevator-door safety device....H. A. McGrory
Elevator-indicator....J. D. Griffen

Embroidering-machine jacquard mechanism....J. A. Groebli
Embroidering-machine stop mechanism....J. A. Groebli
Engine brake mechanism, Traction-....J. and W. Minnaugh
Engine-cooling fan, Explosion-..E. V. Croston
Engine coupling, Traction-....W. J. Stenger
Envelop....F. Peterson
Exterior operating-machine....J. F. Ohmer
Fare-register....J. F. Ohmer
Fare register and recorder...J. F. Ohmer et al
Fare-register, Means for electrically operating the operating mechanism of a...J. F. Ohmer
Fertilizers, Making complete....J. R. Young
Fiber cleaning and preparing apparatus....J. K. Toles
Fiber coiling and packing machine..R. Dawson
Field-ration mess-kit....G. H. Preston
Fire-hydrant emergency-coupling...J. B. Fuller
Firearm....A. J. Aubrey
Fireman's mask....R. E. Cheesman
Fish-hook....A. S. Hickey
Fish-iron....C. Shröder et al
Fishing-rod....W. J. Farr
Fishing-rod attachment....H. H. Crosier
Fixture-support....M. W. Pitner
Flood-gate....J. M. Burkett
Floor-scraping machine....A. Schwenke
Flower-stand, Adjustable....F. H. Moore
Flue expander and cutter....V. Stavenik
Fly-wheel....R. W. Guilford
Folding and wrapping machine....C. Owens
Folding chair....H. C. Forshay
Foot-register....F. C. Parker
Fruit and vegetable masher....J. S. Beienburg
Furnace....D. Johnson
Furnace....J. A. Bradburn
Furniture....F. P. Grode
Fuse-mounting....J. J. Lyng
Gambrel-hook....J. L. Smith
Garbage-burner....J. A. Burwell
Garment-fitting device, 2 pats...M. M. Johnson
Garment wrapper and protector..L. W. Wilms
Gas-burner and water-heater for ranges, Combined....H. Van Buren
Gas-hose attachment....P. Maggio
Gas, Purifying....E. L. Hall
Gas-service-pipe automatic injector....W. E. Vaughn
Gas storage apparatus, Liquefied-....M. Chase
Generator....M. W. Pitner
Glass-cutter....W. G. Stebbins
Glasses, Tourist's....J. M. Faehrmann
Glue-tester....E. S. Smith
Gongs, &c., Mechanism for....H. E. Reeve. (Reissue.)
Grain-reducing machine....C. Jaquet
Grass-cutter....F. Nash
Grinding-machine....C. M. Conradson
Grinding-mill....C. N. McLaughlin
Gun, Air-....W. F. Markham et al
Hair and wool clipper, Electrically-actuated...H. Luense
Halter....J. E. Grifen
Harness-saddle....C. H. Grings
Harness-winker....M. J. Rau
Hasp-lock....W. F. Hunt
Hat, coat, and umbrella rack....C. E. Garner
Headlight-operating device....F. A. Hamm
Heater....J. C. Plank et al
Heating system, Low-pressure steam and analogous....B. R. Doody
Heel....M. H. Finn
Hinge....H. Lange
Horse-checking means....T. Todisco
Horse-releaser....M. Louviere et al
Husking-roller....G. H. Gehrking
Hydrocarbon-engine....R. C. Lewis
Hydrometer and profile-recording machine....A. Mercau
Ice-cream freezer....H. Viedt
Ice, Making and harvesting plate-....D. J. Havenstrite
Ignition-timer....L. B. Shivers
Indicator luminous substance....A. Junghans
Induction motor and generator..R. D. Mershon
Ink, Stenciling....C. E. Pellew
Inlaying, ornamenting, and case-hardening metallic surfaces....S. O. Cowper-Coles
Internal-combustion engine..G. M. S. Tait et al
Jar cover-fastening....W. A. Bostwick
Journal-bearing....W. J. Fisher
Journal-box dust-guard....G. L. Mansfield
Junction-box....W. A. Charters et al
Kettle-still....A. W. Blunden
Label-coating machine....G. E. Inman
Lamp carbon-holder, Electric-....C. J. Lang
Lamp headlight, Arc-....B. B. Lacy
Lamp-socket, Multiple....L. J. Castonguay
Lantern attachment....O. A. Willett
Lantern-frame....H. S. Boode
Lantern, Tubular....F. K. Wright
Lantern, Tubular....C. L. Betts
Lawn-trimmer....H. J. Rober
Leather product and making the same....H. Mackay
Leg, Artificial....O. A. Watson
Life-guard....B. Lev
Lifting-jack....J. B. Taylor
Light-distributer....L. Stiassny
Link, Fusible....G. I. Rockwood
Linoleum, 2 pats....W. D. Snow
Litter-carrier, 2 pats....A. Jenson
Lock....W. Szymanski
Lock....C. Zielenski
Lock key-holder....E. A. Benjamin
Locomotive....G. Höhner
Locomotive reverse-shaft, Articulated-....G. W. Henry, Jr.
Locomotive sanding apparatus...C. E. Richards
Loom double batten, Ribbon-....C. Schneider-Gerster
Loom protection mechanism....J. Northrop
Loom protection mechanism....W. F. Draper
Loom-shuttle....J. H. Morin
Loom shuttle-motion....E. H. Ryon
Loom stopping mechanism....T. A. B. Carver
Lubricating apparatus....M. J. Maloney
Mail-pounch-exchanging apparatus....A. Monteith et al
Mantle and burner therefor, Incandescent....D. Anderson
Manual planter....S. A. Sierra
Manure-carrier....O. Rosenthal
Match-receptacle....J. H. Evers
Match-safe....J. Harbolsheimer
Matrix-retainer....J. W. Ivory
Metal-founding apparatus....F. P. Johness
Metal frame....G. N. Baker
Metals, &c., Casting....F. Schneider
Meter-box....H. E. McWane
Milk-can....G. M. Weeks
Milk-pail....J. D. Perry
Milking apparatus....K. I. Lindström
Mine-ventilating system....J. Quin
Mining and track tool, Combined....W. L. Groom
Molding-machine....D. Parks
Mop....A. F. Brown
Mosquito-bar holder....N. L. Mélancon
Motor-boat steering device....H. J. Perkins
Motor construction, Induction-...H. F. Elshoff
Motor ignition apparatus, Multiple-cylinder-....B. L. Lawton
Mower....W. T. Benham
Mower fly-wheel attachment....J. P. Forst
Mower, Lawn-....G. A. Culver
Nail-extractor....M. Wenger
Nest, Hen's....C. H. Wolford
Non-aqueous mixtures and product thereof, Preparing....E. G. Acheson
Nut-lock....W. M. Offutt et al
Oil and water separator....H. F. Maranville
Oil filter and purifier....A. H. Franke
Oiler, Automatic....E. E. Messmore et al
Ore and other materials, Oscillating screen for....A. B. Colcord
Ore-concentrating apparatus....W. M. Sanders
Ores containing precious metals, Ammonia-cyanid process of treating....D. Mosher
Orthopedic apparatus....K. Johannesen
Packing, Fibrous lubricating-....S. A. Flower
Packing, Metallic....M. F. Fulford
Paper-cutter clamp....C. Seybold
Paper-feeding machine....J. Kleidmann
Party-line indicating-key....C. H. Smith
Party-line indicating-key....G. M. Campbell
Pen, Writing-....W. H. Schweizer
Perforating mechanism....C. A. Sturtevant
Permutation-lock....J. R. Maxfield
Petroleum and its distillates, Purifying crude..L. Edeleanu
Phonograph repeating mechanism....E. Gilbert
Photoprints and similar articles, Machine for mounting....J. Ranz
Picture-frame....C. R. Ulmen
Pin....M. J. Blessing
Pin....S. F. Bagg
Pistol, Automatic....N. Pieper
Plaster-board....L. E. Fishack
Plow....N. Giusto
Post attachment means, Binder-....R. Krumming
Power appliance....M. C. White et al
Press indicator, Baling-....J. R. Alexander
Pressure-regulator....A. Kleinfeldt
Pressure-regulator, Automatic....P. Lulli
Printer's quoin....O. E. Vessels
Printer's quoin....S. Stephens
Printing from blocks and forms, Making ready for....D. Hennequin et al
Printing-press bed-motion....W. K. Hodgman et al
Printing-press feeding-machine attachment....J. Kleidmann
Projectile....R. Naglo
Projectile, Explosive....M. C. Maunsell
Proteids from buttermilk, Producing certain...L. H. Reuter
Pulley, Cut-out suspension-....C. S. Moon
Pulp-screen....B. W. Boyd
Purse or bag frame lock....B. vom Eigen
Puzzle....H. F. Trout
Radiator foot-rest....G. W. Gage, Sr.
Rail-bond protector....W. B. Cleveland
Rail coupling Steel-....J. O. Thompson
Rail-fastener....W. J. Allin
Rail-spike....J. M. Scott
Railway cross-tie....F. E. Ahbott
Railway-rail....R. A. Hadfield
Railway safety appliance, Mine-....N. W. Dickerson
Railway signal sytem....R. B. Davis
Railway-switch, Automatic....R. E. Johnson
Railway-switch, Automatic....F. Wolf
Railway-tie....J. G. Wittwer
Railway-tie....G. L. Bower
Railway-tie and rail-joint....C. Jenkins
Railway-track frog....J. E. Lewis
Razor, Electric safety-....L. Brunacci
Receptacle-support, Adjustable...W. L. Latou
Recording device....H. Bradford et al
Reeds and water-plants growing in ponds and rivers, Device for cutting away....F. C. Ziemsen
Register....C. W. Yipfler
Retort-closure....P. Plantinga
Ribbon, &c., displaying device....H. Wixon
Road-culvert....L. Blakestad et al
Roadway, Composition....B. F. Richarson
Roll, Drawing-off....J. R. Milson
Root-digging machine....T. H. Maley
Rotary engine....C. Hetherington
Rouge-holder....A. Schneider
Saddle, Harness-....F. E. Adelbrock
Sand-blast apparatus....D. A. Nichols
Sash-fastener....J. W. Rykard
Sash-holder....A. H. Mix
Sash, Sliding and swinging....N. P. Sjobring
Sash-weight....P. G. Weigert
Scoop-handle....G. A. Byor
Score-board....G. E. Baird
Seal-press....H. S. Maidhof
Sealing receptacles from which air or gas has been exhausted, Hermetically..S. Eisenstein
Sewage-ejector....W. McClintock
Sewing machine, Buttonhole-....C. A. Dahl
Sheet-metal putty-container....H. Ross
Sheet-steel keg....C. Stollberg
Sheet-steel vessel....C. Stollberg
Shingle-painting device....A. L. Condray
Shoe-sole, Antislipping....J. G. Doughty et al
Shoe-stretcher....C. B. Kosters
Shoulder and body brace, Combined....J. D. Orear
Shovel, Surface-cultivating....L. B. Penton
Sickle-bar attachment....J. McDermott et al
Sifter, Flour-....C. L. Jones
Sifter for pulverulent material..R. G. Neumann
Sifter, One-hand....W. J. Gould et al
Sign, Illuminated....A. H. Hawkes
Signs, letters, and designs, Manufacture and painting of....G. M. Ferguson
Silo....A. A. Doty
Skate....W. E. Tait et al
Sliding gate....G. P. Janes
Small-arm, Recoil-operated....P. Mauser
Snap-fastener....G. A. Holmes
Sole-rounding machine....B. F. Mayo et al
Spinning and doubling machine spindle....W. T. Smith
Spring-clip construction....M. L. Senderling
Spring construction....F. E. Holland
Spring-forming tool, Spiral-....H. M. Daniels
Sprinkling machine, Rotary barrel-....J. Müller, Jr.
Square....B. M. and R. R. Randall
Station or street indicator...E. W. McCutchen
Steam-trap....J. T. Cookson
Steam-trap....J. E. Purser
Steamer and cooker....R. R. Jensen
Stereotype-matrices, Machine for the production of....F. Mäurer
Street-sweeping apparatus....G. W. and C. W. Baker et al
Stuffing-box, Safety....J. H. Keeter
Surfaces, Treating....J. Spelta
Swing....T. D. Montague
Switches and for other purposes, Mechanism for controlling time-...J. N. Reynolds et al
Syringe, Antiseptic....C. Piers
Tag....S. C. Hull
Tag, Shipping-....G. C. Carman
Talking-machine automatic brake...G. Buelna
Tank-lug....J. Reichert
Telegraphic transmitter, Keyboard....P. B. Delany
Telephone apparatus....C. H. Viggars et al
Telephone, Intercommunicating..H. C. Thomson
Telephone-receiver....H. W. Sullivan
Telephone-receiver....W. E. Peters
Telephone-switchboard connecting-jack....C. H. Smith
Telephone-testing system....H. C. Goldrick
Telephone trunking system....C. S. Winston
Therapeutical apparatus....A. H. Shoemaker
Thermo-electric pile....A. Rittershaussen
Thresher-tooth....C. H. Rechtenbach
Ticket....E. A. Hoen
Tie-plate....W. Goldie, Jr.
Tile-machine plunger....G. F. Keil et al
Timber-tie....R. R. Clem
Tire....L. M. Nelson
Tire-mold....P. D. Thropp
Tire, Pneumatic....E. J. Hicks
Tire-shield....J. Burmeister
Tobacco press, Lump-....C. R. Mahone
Toilet-case....E. Erickson
Tool, Board-setting....W. R. Harris
Tool-holder....C. E. Brown
Tooth, Artificial....F. Sheinman
Tooth, Artificial....J. W. Ivory
Toothpick....A. C. Perkins
Toothpick-boxing machine....C. C. Freeman
Torch, Alcohol-....A. W. Straight
Tourist's traveler's cap...H. C. Harrison et al
Toy....J. C. Schweida et al
Toy....A. C. Tytler
Toy flying-machine....E. H. Eichenfels
Trace-holder....J. S. Douglas
Tracker-board....R. W. Pain
Train signal and stopping system, Automatic compressed-air....R. B. Robinson
Transmitting instrument....G. E. Winslow
Tripod....L. C. and E. C. Roehlk
Trolley....P. H. Rosskamp et al
Trolley, Detachable conveying-..R. J. Ellsworth
Truck, Loading-....T. S. Chesnutt
Tube and rod cutting mechanism....R. Bartholomäus
Tube-joint....G. Politz
Tufting-machine....W. E. Buser
Turbine....E. I. Braddock
Turbine....R. H. Goldsborough
Turbine-blade-fixing machine..S. Z. de Ferranti
Turbine steam-packing....C. P. Wehterbee
Type-writing machine....A. T. Brown
Type-writing machine....A. W. Smith
Umbrella-notch....F. A. Smith
Valve....G. W. Shields et al
Valve, Check-....C. I. Williams
Valve, Gas-engine....W. S. Huyette
Valve, Pipe-....W. B. Vestal
Varnishing-machine....B. L. Bradley
Vault, Burial-....R. J. Bratton
Vegetable-cutter....R. L. Dorsey
Vegetable parer and cutter....M. L. Hawks
Vegetation-destroying composition..P. Murphy
Vehicle....R. N. Martz
Vehicle-axle....R. C. Martin
Vehicle-running-gear frame-section...G. Higley
Vehicle-spring....M. M. McIntyre
Vehicle-spring shock-absorbing-mechanism....W. P. Kidder
Vehicle-wheel rim-tightener....J. Hamilton
Vending-machine....H. A. Thexton
Ventilating-louver....A. W. Stewart
Ventilator....C. C. Knauss
Vessel-closure....R. M. Whitson
Voting-machine....J. H. Dean
Wagon-bed protector....G. I. Fornwalt
Wagon-brake-rod connection....O. Wooten
Wagon seat....N. Beatty
Watch-bow attachment....C. Arthur
Water and gas box for service-pipes....T. P. Fitzgerald
Water-closet coupling....W. H. Foulois
Water-cooling apparatus....J. B. Clanton
Water-heater....W. B. Swindell et al
Wattmeter, Integrating-...B. E. Getchell et al
Wheel-rim....F. C. Miller
Wheel-tire chain mat....B. J. Morehouse
Whip-lock....W. G. Lieser
Window box or casing....N. P. Sjobring
Window-cleaner....H. L. Bailey
Window-fastening device, Storm-..C. W. Coffin
Window frame and sash....P. G. Wiegert
Window-pane fastener....S. Roush
Window-screen....A. H. Mix
Wire-drawing-machine inverted drum....J. A. Horton
Wire or cables for electric or other purposes, Apparatus for the manufacture of lead-incased....C. Tatham
Wire set-still tension, Woof-..O. S. Sturtevant
Wood-scraper....I. H. Banke
Woodworking-machine....C. Bruderlein
Wool and other fibrous materials, Machine for cleaning....F. G. Sargent
Wool and other similar fibers, Combing-machine for, 2 pats....J. Cooper et al
Wrapping and pasting machine....C. Owens
Wrench....J. King
Wrench....C. Waller
Wrench....H. A. Paquette
Wrench....W. C. Shay
Wristband....B. A. Paroubek
Yoke, Neck-....C. Christensen et al

DESIGNS.

Box....C. M. Pease
Diaphragm-actuated horns, Diaphragm case and resonator for....M. R. Hutchinson
Emblem....G. S. Merrill
Fabric, Printed....J. Korzinek
Fabric, Textile....P. Mouton
Mat....H. C. Seipp
Medal....W. H. Heath
Spoons, forks, or similar articles, Handle for....J. E. Birmingham

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MECHANICAL PATENTS.

Adjustable handle....W. J. Stroud et al
Adjustable wrench and tool....P. Tavernetti
Advertising device....C. D. Stoll
Advertising or display apparatus, Automatic....H. M. Schutz
Air and other gases, Apparatus for separating heavy particles from....W. J. Baldwin
Air-brake apparatus....J. O. Dodge
Air-brake system....G. Macloskie, Jr.
Air-brake system angle-cock....S. H. Dunning
Air-lift for deep-well pumping, Equalizing multiple....R. H. Elsey
Air-ship....F. L. Orr
Alarm and telephone system....G. Babcock
Alloys, Manufacturing....H. Kuzel
Amusement apparatus, Racing, 2 pats....M. Lehman et al
Amusement device....W. J. Manning
Anchor, Land....J. H. McNutt
Anchor, Rail-....W. H. Walker
Animal-trap....J. C. King
Animal-trap....B. A. Swasey
Animal-trap atachment....M. Gravatt
Automobile steering-head....H. C. Stutz
Axle-lubricator....L. E. Sherwood
Bag-machine....J. F. Ames
Basket, Collapsible floating....A. Lehmann
Bath cahinet, Vapor-....L. C. Jaques
Battery-charging system....W. I. Thomson
Bed-bottom, Spring....E. A. Bedient
Bed, Invalid-....L. W. Ward
Bed, Metal, 2 pats....J. M. Adams
Bed-spring lifter....C. A. Hermann et al
Bedstead....H. A. Sears
Bedstead....H. T. Stevenson
Bell switch, Multiple-call-....L. I. Freas
Belt, Conveyer-....M. C. Graney
Belt-perforating gage....A. Pullen
Belt-replacer....J. Horinek
Belting....E. A. Usina
Binding-post....J. W. Feerer
Block-signal....M. J. Feron
Boat....N. B. Broward
Boat propelling mechanism....J. T. Stafford
Boat steering device, Power-..F. A. Warren, Jr.
Boiler....F. S. Snyder
Boiler-feeder....J. F. Senter
Boilers, Composition for preventing scale in....G. Wegener
Book binder, Loose-leaf-....A. S. Harn
Book, Manifolding....J. Kitchen, Jr.
Book, Sales-....E. K. Bottle
Borax, Making....G. E. Bailey
Boring-machine....M. L. Andrew
Bottle-filling machine....J. M. Falls
Bottle-filling machinery....L. McCampbell
Bottle, Non-refillable....H. Gehman
Bottle-stopper....J. J. O'Grady
Box....E. L. Ansorge
Box for berries, &c., Collapsible..O. C. Fenlason
Box for berries, &c., Collapsible veneer, 2 pats....O. C. Fenlason
Box for the display of articles contained therein....G. A. Durkee
Bread, Making albuminous....G. Hess
Bread, Making albuminous....O. Müller
Breaker and alarm, Vacuum-....B. W. Hill
Bridge, Lift-....E. Swensson
Bridle and throat-latch snap....B. L. Miller
Brooder, Chicken-....E. P. Huffman
Brush attachment....J. T. Hart
Brush mounting, Bottle-washer...A. N. Davis
Brush, Shoe-....J. H. Grafflin
Bucket-bail....W. B. Eason
Buckle....W. A. Meyer
Buckle....J. A. Alcorn
Buffing or polishing wheel....F. M. Levett
Bundle-tie....T. M. Price et al
Button, Shirt-....C. R. Jacobs
Cabinet....C. B. Reese
Cabinet, Sectional file-....C. W. Pomeroy
Cake-machine....C. G. Tucker
Cake-mixer....C. W. Hottman
Calculating-machine ribbon mechanism....A. Pentecost
Can-opener....C. A. Wade
Candlestick....T. Gossack
Candy-cutter, Adjustable combination....J. Lindberg
Car-buffer....G. P. Parton
Car corner-anchor....H. E. Haddock
Car-door....J. W. Rumsey
Car draft-rigging, Railway-....S. B. Haseltine
Car-dumping mechanism, Cupola....J. Hyslop
Car folding stake, Railway-....J. W. Kendrick
Car, Passenger-....H. Howson
Car-stake....S. Haley
Car stake, Railway-....S. W. Murray
Car, Tank-....T. G. Phinny
Car ventilator, Railway-....J. E. Ward
Cars, Friction-brake to prevent side motion of....G. Hagberg
Carbureter....W. K. Andrew
Carbureter....C. Fox
Carbureter for internal-combustion engines....W. A. Daley
Cards, &c., Packaging playing-....W. H. Dougherty
Carpet-beater....A. F. Mewes
Cartridge....A. Wratzke
Cement-applying machine....W. F. Lautenschlager
Cement building-block....J. Crawford
Cement, Hydraulic....A. C. Spencer et al
Centrifugal machine....A. J. Ericsson
Ceramic-material charger....C. Gielow
Chain-straightening mechanism..B. T. Tompkins
Chain, Tire-....F. A. Fox
Chair....W. F. Wells
Chamfering and countersinking machine....C. F. Messinger

Character-bars, Making, 2 pats..D. W. Dodson
Character-forming machine, 2 pats.....D. W. Dodson
Check-controlled game apparatus.....J. Graves
Cheeking and unchecking device..A. R. Ward
Cherry-pitter.....W. J. Mack
Chimney-top.....E. J. Cochran
Churn-cover.....J. W. Jackson
Cigar-box holder.....B. L. Fowlkes
Cigar-bunches, Making.....S. I. Prescott
Cigar-cutter.....A. W. Barton
Circuit-closer.....A. B. Culver
Cleaning-knife.....T. S. Moffett
Cleat, Porcelain.....E. Ball
Clevis.....U. Desallier
Clevis.....W. H. Livingston
Clock and coin-freed winding apparatus.....A. G. P. Wiingaard
Clock, Electric.....H. H. Engelberg et al
Cloth-transfer shect.....K. M. Kaye
Clothes-drier.....K. Erickson
Clutch device.....W. H. Pike, Jr.
Coaster-brake, Back-pedaling...A. P. Morrow
Cock, Automatically-closing.....A. O'Brien
Cock, Stop and waste.....W. W. Watters
Cockeye.....M. R. Johnson
Coffee-roaster.....A. Landry
Coffin-box.....J. A. Cook
Coining-press.....O. Smith
Collar, Adjustable horse.....H. A. Newby
Collar-fastener.....S. H. Tolman
Color-whirligig.....W. R. Evans
Combustion-furnace, Smokeless.....R. Stoker
Commutator construction.....H. H. Ralston
Concrete buildings, Framework for the construction of.....W. W. Carpenter
Concrete-mixer.....W. E. Hassam
Concrete piles, Method and apparatus for sinking.....F. B. Gilbreth
Concrete shingle.....E. P. Auger
Concrete structure, Reinforced.....L. White
Conduit-rod.....E. L. Upson et al
Connection, Releasable.....C. H. Dempsey
Contact-maker.....F. E. Kinsman
Controlling-switch.....G. H. Hill
Cooler and aspirator.....J. D. Devoss
Cooling apparatus.....H. J. Vasconcelles
Cooling apparatus.....J. W. Jackson
Core compound.....E. E. Howe
Corn rack, Seed.....W. Ulbrich
Cornet.....S. Adkins
Cornet bell-mute.....C. G. Conn
Cotton and wool mixed goods, Production of effects on.....P. G. Jones
Cotton-chopper.....E. May
Cotton-gin.....C. Tuckfield
Coupling.....T. W. Christian
Coupon or tag for cartons.....J. A. Kyle
Crate, Storage and shipping.....G. Klenk
Creel.....I. E. Palmer
Cultivator.....J. Horinek
Curtain-holding device.....C. L. Hopkins
Curtain-pole fixture.....F. L. Lathrop
Cutting machine, Flange.....C. L. Finch
Cylinder relief and drainage device.....F. C. Miller
Damper-regulator.....H. Walker
Dental brush.....J. H. Abbott
Dental floss-holder.....J. P. Locke
Dental mirror and attachment therefor.....A. J. Kleberg
Dental obtunder, Atomizing..W. A. Cook et al
Dental suction-plate.....C. R. Powers
Derrick, Portable.....W. C. Booz (Reissue.)
Die.....D. W. Dodson
Disappearing stand.....G. F. Oldham
Disks, rings, &c., Machine for punching.....B. J. Lindgren
Dispensing apparatus.....E. Davis
Display-stand.....E. M. Graham
Ditching-machine.....A. McDonald et al
Door, Fireproof.....O. E. Moulton
Door, Grain.....T. J. Campbell
Door-hanger.....J. Simpson
Door-operating device.....T. J. Naulty
Door trolley-track, Sliding.....G. Lane
Draft-rigging, Friction, 2 pats..J. F. O'Connor
Driving and reversing mechanism, 3 pats,.....F. Snow
Driving and reversing mechanism, Combined..C. G. Hawley
Drum snare-strainer.....J. E. Lynehan
Drum snare-strainer and muffler.....W. F. McIntosh
Dye and making same, Orange lake...R. Lauch
Dye and making same, Red cotton..R. Schüle
Electric circuit, Phantom.....H. B. Stone
Electric controlling system.....D. C. Jackson
Electric-fixture outlet-bracket....N. Hublinger
Electric induction-motor, Multiphase.....H. A. Mavor
Electric machine, Dynamo.....B. Elshoff
Electric machine, Dynamo.....E. C. Wright
Electric motor.....G. Seidel
Electromagnetic structures, Method of and means for securing in position conductors of.....B. Frankenfield
Electroplating apparatus.....J. T. Daniels
Elevator.....M. E. Neenan
Elevator controlling mechanism...T. Larsson
Elevator locking device.....A. G. Rose, Jr.
Elevator safety appliance.....T. Rowley
Elevator safety device....M. D. Vanderheyden
Engine.....C. I. Henrikson
Engine.....W. H. McLeod
Engine crank-box, Gasolene.....G. L. Lyon
Engine valve mechanism, Gas...S. Jachimovicz
Engraver's block.....A. Muehlmatt
Engraving-machine.....V. J. Hansen
Envelop.....G. M. J. Ahlstrom
Envelop.....L. Levy
Explosion-engine.....T. Matson
Eyelet.....F. H. Rees
Fan or pump, Centrifugal.....J. W. Kellogg
Fastener and seal, Combined.....C. W. Gill
Faucet, Self-closing.....P. W. Doherty
Fence clamp, Woven-wire.....J. Fisher
Fence-post, Conerete.....H. L. Ford
Ferment and producing it.....A. D. Barr
Fertilizer-distributer.....J. K. Gourdin
File.....T. J. MacKay, Sr.
Filter.....E. Scheuerer
Finger-ring.....C. M. Levy
Finger-shield.....A. W. Krieger
Fire-alarm.....V. Kall
Fire-alarm circuits, Circuit-eloser for.....R. D. Tiffany
Fire-escape.....P. Nigro
Firearm telescope-sight.....G. F. Matteson
Fish-hook, Automatie.....B. Timmons
Flour, Core.....W. Goldie
Flour-maehine.....S. L. Snyder et al
Fluid-pressure indexing mechanism.....B. M. W. Hanson
Fluid sprayer, Multiple.....E. J. Frazier
Flying-machine.....W. D. Valentine
Forming-machine.....A. T. Sisson
Fowl-roost.....J. B. Mason
Frog, Wreeking.....G. E. Nyquist
Fruit-carrier.....C. A. Wellman
Fuel, Composition for treating.....E. H. Ellis
Furnace and converter twyer, Blast-.....C. Robinson
Furnace or cupola bottom-door hoist.J. Hyslop
Furnace twyer-sight, Blast.....U. G. Davis
Furniture.....J. Baumgartner
Fuse, Impact.....K. Wieser
Fuse, Time.....W. Schwartz et al
Garment-clasp.....F. A. Traver
Garment-display device.....W. Mehler
Garment-hanger.....R. C. Thomas
Garment-supporter.....R. F. Bartel
Garment-supporter.....E. M. Tacy
Garter-fastener.....C. M. Simpson
Gas apparatus.....A. L. Cihak
Gas-burner.....G. S. Andrews
Gas-generator.....A. Ammentorp
Gas generator, Water-....W. E. McKay et al
Gas-heater automatic controller.....A. J. Krein et al
Gas-main construction.....M. G. Moore et al
Gas, Making.....H. L. Doherty
Gas turbine engine.....H. Lentz
Gaseous fuel, Apparatus for igniting.....D. S. Brown, Jr., et al
Gases for general anæsthesia, Apparatus for generating and administering.....C. R. Cummins
Gate.....I. A. Wesson
Gate automatic constant discharge, Water.....F. W. Hanna
Gate-operating means.....S. McChesney
Gates, &c., Means for opening and closing....C. E. Barnes
Gear, Carriage and wagon running-.....R. B. Sheridan
Gearing, Friction.....W. R. Jenkins
Glass bottle-necks and stoppers therefor, Grinding interchangeable ground-.....C. M. Conradson
Glass-grinding-machine abrading-disk.....I. Ramboux
Glass, Process and apparatus for making plate, window, or wire.....J. J. Quertinmont
Glass, Molding-frame for making sheet, plate, or wire.....J. J. Quertinmont
Grain-separator.....G. Feickert
Grappling device.....L. Shields et al
Grinder, Rotary.....T. A. Panyard
Grinding-disk sliding spindle...J. Miller, Jr.
Gun, Barrel recoil-.....M. Hermsdorf
Gun, Breech-loading safety-.....O. Scott
Gun-carriage.....N. Koch
Gun-receiving vehicle, Portable.....M. Dreger
Gun, Recoil-.....K. Theele
Gun-sight.....D. B. Harris
Gun-sight.....G. M. Wanee
Hair-curler.....H. N. Northrop
Hair-waving device.....J. C. Bradley
Hame and tug connection.....B. F. Emery
Hammer.....H. Symonds
Hammer, Pneumatic.....A. J. Doughty
Hammock or swinging seat and supporting-frame therfor.....W. S. Bowie
Handle attachment.....F. E. Whitney
Harness-stay.....G. L. Forman
Harrow riding attachment.....J. R. Trotter
Harvester.....A. J. Parton
Hat-brim-curling machine.....J. P. Rochford
Hat-fastener.....A. A. Roberts
Hat-ventilator.....W. R. Montgomery
Hay-loader.....R. L. Mealus
Head-rest.....J. C. Bahr
Headless and threadless bolt.....J. J. Souder
Heat-regulator.....C. F. Rukes
Heater.....J. T. Burr
Heating apparatus, Steam-.....M. P. Osbourn
Heel-lift cutter.....R. W. Perry
Hinge.....L. W. Ashley
Hinge-socket cutter.....J. Salois
Hitching device.....J. Siemsen
Hog-hanger.....E. Shively
Hoisting apparatus.....F. F. Joseph
Hoof-trimmer.....J. R. Peifer
Hoop-projecting device...C. M. Bartholomew
Horse, &c., automatie fountain.....G. C. Hart
Horse-detacher.....E. E. Sanders
Horse headlight attachment.....P. A. Libby
Horsehair and other cellulose products having resistance and elasticity, Manufacture of..E. Crumiere
Horseshoe.....J. P. Dunn et al
Horseshoe.....H. Paar
Horseshoe, Cushioned.....F. Steelman
Hose-clamp.....P. E. Erickson
Hose-coupling.....T. B. Reid
Hub.....M. S. Towson
Hydrocarbon-furnace.....J. Grow
Insulating high-voltage transmission-lines.....W. T. Goddard
Interlocking machine.....J. S. Hobson
Internal-combustion engine...A. O. McCollum
Iron and steel, Manufacturing.....C. Ellis
Ironing-machine.....O. W. Powell
Jars, Lifting-tongs for fruit-.....P. O. Kaffke
Jet-condenser.....W. B. Potter
Kiln.....J. E. Kennedy
Kinematograph apparatus.....R. A. Fauconnet
Kinetoscope.....C. J. Lang
Knife-sharpening machine.....J. Müller
Knitting-machine.....W. D. and L. C. Huse. (Reissue.)
Knitting-machine plating device...E. A. Hirner
Ladder, Painter's.....A. B. Thompson
Lamp filaments, Solder for incandescent-.....H. Kuzel
Lamp, Hydrocarbon inverted-mantle.....O. J. Seehausen
Lamp, Illuminating sign-.....J. G. Saftig
Lamp, Metal-filament electric glow-...H. Kuzel
Lamp-wick, Safety.....J. C. Smith
Lasts, Forming.....E. J. Prindle
Lawn-sprinkler.....H. Gibbs
Leg, Artificial.....D. B. James
Letter-facing tray.....M. S. Field
Leveling instrument.....E. A. Bostrom
Lifting-jack.....W. E. Allgeo
Lifting-jack.....J. A. Mills
Line and traee holder, Combined.....I. L. Carlton
Linotype-maehine.....H. Larsen
Linotype-machine.....W. H. Scharf
Liquid-discharging device.....W. C. Morrill
Liquid-meter.....E. L. Barnes
Liquids, Heating.....P. M. C. Mauvernay
Locking-clamp.....P. J. Bernard
Locking receptacle, Automatic-...J. W. Carter
Locomotive-engine.....S. K. McLain et al
Loom.....A. E. Stafford
Loom, Automatie weft-replenishing.....J. C. Brooks
Loom filling-exhaustion-indicating mechanism..C. E. Nutting
Loom filling-exhaustion-indieating mechanism, 2 pats.....A. E. Rhoades
Loom weft-feeler.....J. Northrop
Lubricator.....E. McCoy
Mail and parcel binder.....A. M. Jayne
Mail-box, Rural.....A. C. Brumwart
Mail-catcher.....J. B. Ramsey et al
Mail-marking machine.....F. C. Ielfield
Mail-packeting machine.....H. W. Reifenstein et al
Manhole-guard, Disappearing.....R. Parks
Manifold deviee.....O. M. Delesdernier
Manure-spreader.....C. W. Smith
Massage-applying apparatus, Internal-.....F. L. Talcott
Massaging devicc.....W. I. Miller
Match-box.....E. E. McNeil
Measuring and computing apparatus, Self.....E. Nicholas
Measuring instrument.....J. J. Jones
Measuring instrument.....E. Schattner
Measuring the humidity in or determining the evaporating power of the air, Apparatus for.....M. M. Hastings
Meat-labeling machine.....R. A. Pearson
Meat-rack.....L. I. Berkowitz
Mechanical movement.....W. H. Gaskill
Medical implement.....W. M. Parks et al
Metal box.....G. Klenk
Metal cleaning, polishing, and plating compound.....M. Curtin
Metal-planer.....H. Bertram
Metal-planing machine, &c., Feed mechanism for.....G. H. Benzon, Jr.
Metal wheel, Pressed-.....R. T. J. Martin
Milk-strainer-cloth fastener.....I. Foelt
Milling and like machine.....G. Reyher
Mirrors, &c., Holder for frameless.....W. R. Bickford
Mold.....J. K. Williams
Mold filling and tamping apparatus.....O. P. and R. L. Raber, et al
Molding bases upon fence-posts, Machine for..C. S. Long
Mop-head.....J. S. Sourek
Mop-head.....L. W. Merriam
Mop-wringer.....J. Santin
Motor control.....H. H. Clark
Motor-control system.....G. F. Atwood
Mower, Lawn-.....W. E. Hake
Mower, Lawn-.....T. Farr
Mower, Lawn-.....J. C. Highfield
Mower or reaper cutting apparatus.S. Pierson
Music-sheet-controlling device....T. P. Brown
Musical-instrument automatie player.....J. J. Walker
Note-book, Loose-leaf.....C. H. Goodyear
Nite-book, Loose-leaf.....C. H. Goodyear
Nut-machine.....F. Lackner
Oil-burner.....O. S. Davis
Orange-clipper.....W. Leven
Ores of iron, Smelting.....E. D. Kendall. (Reissue.)
Organ, Pipe-.....H. Tellers
Oven, Bake-.....P. Ahlheim
Oven or furnace door, Coke.....J. Whitaker
Overcoat.....J. Bursteen
Package-tie.....V. N. Stone
Packing.....S. E. Condon
Packing, Joint-.....W. J. Knox
Packing-ring expander.....W. H. Richardson
Panic-bolt.....H. G. Voight
Paper clip or clasp.....C. B. Simmons
Paper file and binder.....E. Cloyes
Paper-making-machine press-roll, 2 pats.....W. C. Nash
Paper-reel.....C. E. Pope
Pavement.....W. E. Hassam
Pencil-sharpener.....E. Sutherland
Phonograph horn attachment.....G. Shephard
Piano-action.....R. Lohr et al
Pigments, Producing.....A. Moffatt
Pigments, Producing composite.....A. Moffatt
Pile-driver.....O. Crosby
Piling, 2 pats.....W. Neilsen
Pins, &c., Safety attachment for stiek-.....P. Rittersbacher
Pipe attachment, Tobacco-.....W. E. Frazee
Pipe-hanger.....W. L. Iwan
Pipe or hose coupling.....L. S. Dismuth
Pipe-vise.....A. Senn
Pitmen safety deviee.....J. F. Thiessen et al
Pivot-crane, Adjustable counterbalance.....W. Van Wie
Plant-protector.....S. D. Scott
Planter dropping mechanism...J. A. Anderson
Plate, Wear-.....J. E. Hovendick
Plow and sweep holder.....A. C. French
Plow, Gang-.....H. C. Clay
Plug-receptacle, Armored.....R. A. Shoenberg
Pneumatic-action construction.C. H. Thompson
Pocket-Knife.....G. W. Soderstrand
Poke, Hog-.....T. L. Douglas
Pole-climber.....H. C. Hansen
Polishing-maehine.....C. G. Ferguson
Potato cutter, Seed-.....F. A. Newman
Pottery ornamentation.....A. L. Rock
Power apparatus.....J. F. Sperry et al
Power drill, Hand-.....L. S. Pfouts
Press-feeder's finger-stall.....A. V. Napier
Printing-block-molding machine.....P. Bunau-Varilla
Printing-plate.....M. A. Droitcour
Printing-plates, Casting of curved stereotype..D. W. Jones
Printing-plates, Making.....M. A. Droitcour
Printing-press.....H. F. Anderson
Projectile.....G. H. Hoxie
Propeller, Weedless or self-clearing.....W. L. Casaday
Pump.....A. Blauvelt
Pump.....F. Woodhead
Pump.....H. L. Perrine
Pump, Deep-well.....R. C. Purcell
Pump, Mechanical mereury-sealed vacuum-....M. von Recklinghausen
Pump-strainer.....W. S. Dunstedter
Putty-knife.....W. A. Prout
Raek and holder, Combined....O. M. Harding
Radiator.....A. Landon
Radiator.....O. T. Brown
Rail-clamp.....J. M. Vail
Rail conneetion.....A. McCafferty
Rail-fastener.....W. Wallace
Rail-fastener.....L. R. Gifford
Railway alarm-signal.....J. Shavalier
Railway and tramway reinforeed-eonerete sleeper.....G. Liébeaux et al
Railway automatic safety applianee.....R. D. Farrell
Railway brake-beam.....S. A. Crone
Railway-coach indicator, Street-.....E. Miller
Railway-crossing.....O. F. Jordan
Railway-crossing.....G. P. Keith
Railway-crossing signal.....H. W. Souder
Railway noise-deadening means.....C. E. Lewis et al
Railway safety appliance.....T. McGuire
Railway-sleeper, Reinforced-conerete.....M. Brukner
Railway-switch safety appliance.....A. L. Bishop et al
Railway system, Electrie.....W. E. and J. W. Dawkins
Railway-tie.....R. C. Lukens
Railway-tie.....A. Heath
Railway-tie, Metal.....S. McElfatriek
Railway-tie plate.....R. H. Smith et al
Range burner adjustment, Gas-...B. J. Taylor
Razor-blade-stropping implement.W. H. Nicholls
Railway-tie.....F. A. Buse
Receptacle-opening device.....G. C. Weber
Record, Abstract-.....W. K. Searborough
Record-packet.....G. T. Williams
Reed-motion.....F. Ott
Refrigerating apparatus.....R. Whitaker
Refrigerator.....A. C. Sample
Relay.....E. McClintock
Relay.....F. B. Corey
Resistance.....T. von Zweigbergk
Reversing mechanism.....F. Snow
Rod-adjusting device.....L. Willis
Roost.....T. Thompson
Rotary engine.....W. D. Tutt
Rotary engine.....H. P. McCann
Rubber.....J. S. Ramlose
Sad-iron, 2 pats.....H. Wonderlich
Saddle device, Harness-.....A. F. Montin
Sash-holding means, Window-..W. S. Wright
Sash, Window-.....C. S. Smallwood
Sawing-machine sand-feed, Stone-.....J. M. Owens et al
Scythe.....A. S. and L. D. Orr
Semaphore, Illuminated.....A. D. Archibald
Semaphore-signal.....S. H. Harrington
Sewing-machine attachment.....E. J. Miller
Shade and eurtain hanger.....F. Davidson
Shaving-cup.....J. Handel
Shears.....L. F. Regan
Sheet-metal eaddy for spices and other articles.....G. W. Weber et al
Shoe-eleat.....L. J. F. Rooney
Shoe-guard.....J. Oliver
Shoe-lace tip.....J. Crooks
Shoe-uppers, Fastener for.....M. Bergeron
Shrapnel.....R. Wille
Sighting-machine.....D. A. Fiske. (Reissue.)
Sign.....J. Igelstroem
Sign, Interchangeable.....A. C. Brose
Signal.....W. H. Parrish, Jr.
Sink, &c., support.....J. Rendall
Sink and washtub, Combination.....W. M. De Lory
Slotting-machine.....C. G. Curtis
Smoke and spark destroyer.....G. Z. Gray
Smoke-consuming furnace.....R. L. Walker
Smoke-consuming furnace.....L. Yoksch
Smoker's pipe.....H. B. Saylor
Sound recorder.....C. R. Borland
Spark-arrester attachment.....P. M. Low
Speed mechanism, Variable-..A. L. De Leeuw
Speed-recorder.....G. A. Lee
Spinning and winding machine.....A. J. and H. A. Foulds
Spool-holder.....B. F. Ford
Sprag.....A. Bendle
Sprayer.....C. S. Perry
Spring-hinge.....G. H. Day
Spring-wheel.....G. A. Gustafson
Sprinkler-head.....H. Gibbs
Sprinkler system, Automatie..G. M. Demarest
Sputum-cup.....H. J. Potter
Square, Foldable carpenter's.....C. L. Ruehs
Square, Separable.....W. J. Shuart
Stair-earpet clamp, Invisible.....C. H. Seelye
Stairs or other supports, Newel-post for.....C. E. Paulson
Stalk-cutter.....F. P. Chapa
Steam and oil separator.....H. J. Gebhardt
Steam cooking applianee.....G. W. Ferguson
Steam-engine.....T. F. Scollard
Steam-superheater.....H. W. Jacobs
Stirrup.....J. W. Haddoek
Stock-feeding device, Automatic.....F. Olsen
Stool, Kitchen and laundry.....B. A. Massey
Stop mechanism, Automatic.....F. Snow
Stop-motion, Rotary.....F. Snow
Storage battery, Eleetrie.....H. K. Hess
Stove, Heating.....E. B. Colby
Street-sweeping machine.....J. Banser
Street-sweeping maehine.....V. D. Carroll
Stuffing-box.....S. E. Condon
Sugar-bowl.....S. Juel
Sulfur dioxid, Making.....C. W. Lyman
Surface finish.....P. Neymann
Surgieal instrument.....B. S. Stephenson
Suspenders.....A. F. Motseh
Suspenders.....A. Oppenheim
Suspenders cast-off.....W. B. Murphy
Switch.....A. L. Vissat
Switeh-operating device.....A. L. Huber
Switch-starter, Multiple.....J. T. Janette
Syringe.....F. S. Honsinger
Syringe, Hot-air.....H. E. Vogel
Tag for neckwear, &e.....E. S. Bachraeh
Telegraphic key or transmitter.....H. O. Putt
Telegraphy, Radio-....H. R. von Traubenberg
Telephone.....O. Frazier
Telephone, Desk-.....E. R. Corwin et al
Telephone-exchange system.....W. A. Wynne
Telephone-exchanges, System for metering service on the lines of.....C. M. Beattie
Telescope mounting, Rifle-.....F. L. Smith

Telescope with double hinge, Binocular.....R. Straubel
Thill-coupling.....T. A. Moran
Thill-support.....S. H. Story
Thread finishing and lustering machine, Silk-..E. Pohl
Threads by twisting, Joining.....W. R. Landfear
Threads, Lustering and finishing silk.....E. Pohl
Ticket-holder.....C. C. Gill
Ticket-punch.....C. B. Livermore
Tile-ditching machine.....E. A. Anderson
Time-recorder, Autograph..F. H. Cottrill et al
Tinning or coating machine.....C. C. Roberts
Tire-protector.....G. C. Hoskin
Tobacco-pipe.....C. H. Schroeder
Toe-calks, Apparatus for making.....J. C. Snider
Toilet article.....C. F. Kohler
Tool, Centering or marking....O. L. Albertson
Tool, Counterboring-.....E. E. Veley
Tool-holder.....G. F. Krieger
Tool, Motor-.....C. C. Allen
Toy.....J. J. Mahan et al
Transmission mechanism, Friction-.....J. P. Davis
Tray-holder.....S. M. Schaefle
Trolley-replacer, Electrical.....H. L. Sparks
Trolley, Self-restoring.....J. T. Andrew
Trolley-signal circuit-controller.....A. Bevan
Trolley-wheel.....I. O. Stant
Truck and gage wheel, Implement.....T. Wade et al
Truck, Fireman's.....C. Holst
Truck pedestal, Car-.....E. A. Curtis
Trunk-strap.....C. E. Miles
Try-square, Self-marking.....W. Muck
Turbine.....C. Roth
Turbine.....B. Ljungström et al
Turbine, Elastic-fluid, 2 pats.....C. W. Dake
Turbine, Elastic-fluid.....A. R. Dodge
Turbine, Steam-.....A. Faywischewitseh
Turbine, Steam-.....A. H. Beckman
Turbine vane series.....B. Ljungström
Twine-holder.....J. R. Armington
Twisting-in machine.....W. R. Landfear
Type and type-bar making machine, 2 pats.....F. H. Richards
Type-setting-machine attachment.....H. A. Armstrong
Type-writer.....N. P. Billing
Type-writer, &c., inking device.....F. Dowd
Type-writing machine.....L. S. Burridge
Type-writing machine.....C. J. Rollefson
Type-writing machine.....M. W. Pool
Type-writing machine.....G. A. Greenwood
Type-writing machine.....G. A. Seib
Type-writing machine.....G. H. Smith
Typographic machine.....F. H. Richards
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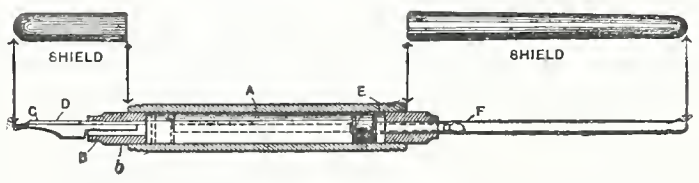
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THE HELICOPTER FLYING MACHINE.

By E. OMMEGANCK.

RECENT developments in the art of flying have proved that in the near future it will be entirely feasible to move in the air with two engines based on quite different principles: the aeroplane and the helicopter. Up to the present the aeroplane has given the best results, owing to the comparatively high degree of perfection that it has reached; but it is possible that the helicopter may yield the final solution of safe aerial transport.

In the concentration of attention on balloons and aeroplanes, the type of flying machine represented by the helicopter has been relatively neglected by those interested in the navigation of the air. It is not, however, new in theory. It was suggested several centuries ago, and it is said that the idea was first brought before the public in 1500, by the famous painter, Leonardo da Vinci; but less work has been done on the helicopter than on any other form of airship. Nevertheless, it possesses certain advantages of operation and a mechanical efficiency that would seem to fit it for an important place in aeronautics. It can start straight up into the air; it can be easily controlled; it is not as large as other airships; it can fly when the weather is windy or stormy; and it does not need a special launching device, as does the aeroplane.

The helicopter which we herewith illustrate was recently tried in France by its inventor Mr. Paul Cornu. As shown in the photograph, the machine consists of two horizontal two-bladed propellors mounted upon horizontal wheels or pulleys. These pulleys are carried upon a suitable framework, the main member of which consists of a large steel tubing arranged in the form of a wide U, in the bend of which is mounted the aviator's seat, and an 8-cylinder Antoinette motor of about 24 horsepower. The superstructure and the backbone of the engine are carried upon a four-wheeled frame, so that it can be run along on the ground. The helicopter being supposed to lift vertically, however, such motion is not absolutely necessary. After it has risen in the air, it is propelled forward by the downward draft of the air against the two inclined planes located at each end of the apparatus. These planes consist of frames of flattened steel tubes, covered with silk. They are about 8 feet long by 2 feet wide, and are arranged to pivot on a horizontal axis passing through their centre from end to end, and mounted on two supports extending out from below the centre of the pulley. The inclination of the planes causes the forward movement of the helicopter, while by swinging them around to the desired point, the machine can be made to turn to right or left. They are operated by two levers, conveniently placed beside the operator.

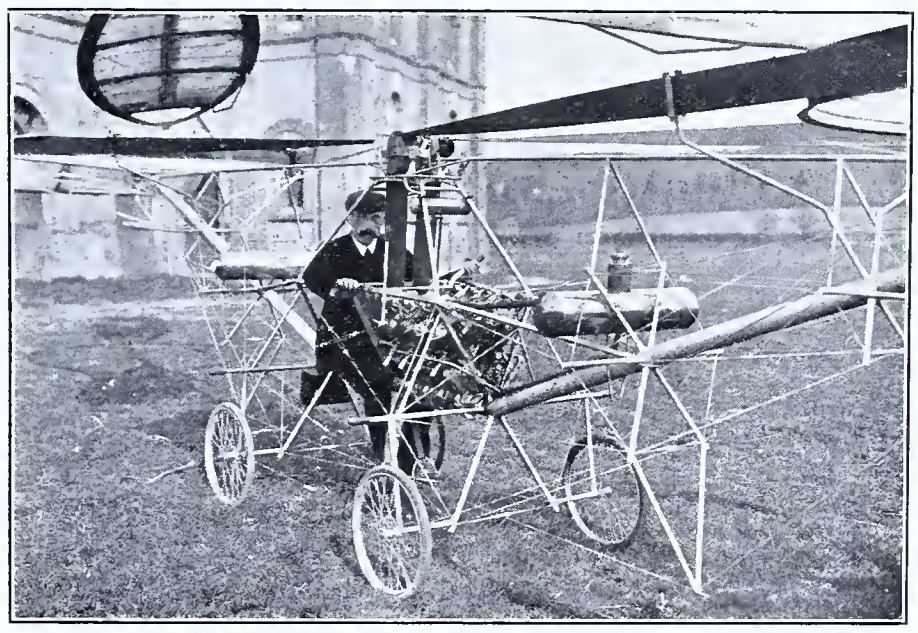


FIG. 1.—THE HELICOPTER READY FOR STARTING.

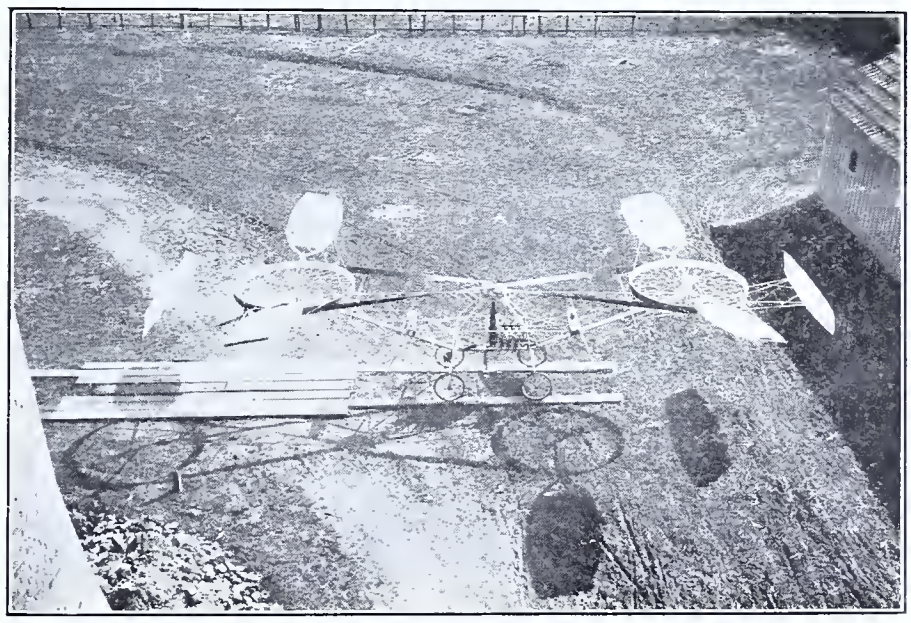


FIG. 2.—HELICOPTER SEEN FROM ABOVE.

The simplest way to secure equilibrium in an airship is by using a very low center of gravity. The objection to this is that it causes excessive pitching and rolling. In the aeroplane, this motion destroys the power to fly, as it spoils the all-important angle of incidence of the supporting planes. But in the helicopter, this angle of incidence is the angle of the blades with the shaft, which remains practically constant whether the machine as a whole pitches or not. Thus a helicopter can be arranged to have a more pronounced pendular stability than is possible with the aeroplane.

Another advantage of the helicopter is that it can be made to hover over any given point, while an aeroplane must continue to move horizontally in order to retain its elevation. This should prove of benefit in taking observations, and selecting a suitable landing place. It can oe constructed more simply than its rival, and simplicity is of great importance in flying machines, as weight and power are both limited, and absence of complexity means gain in reliability and safety. If the motor in an aeroplane is stopped, there will be a sudden drop of the apparatus, and a backward shift of the center of pressure, which is liable to cause a somersault, particularly as the center of gravity in this type of machine is necessarily high, and as curved surfaces are in themselves unstable with the concave side down. In the helicopter, if the motor stops, the stability is not seriously affected. The drop may be made vertically or horizontally, as desired. The low center of gravity will tend to keep the machine right side up. The supporting surfaces may be arranged to have a slow reverse rotation around tbeir shafts, thus forming an efficient and stable rotary parachute. It is believed that this type of airship will come into more general favor as its merits are recognized.

Electric Power from the Susquehanna

The largest single power house in the world is being completed at McCall Ferry on the Susquehanna river—larger even than the great power house above Niagara Falls in this respect, that the power generated at Niagara is the conjunction of what is known as several units. The Susquehanna plant is not a combination of units, but is a single unit, generating more than 130,000 horsepower. This willl be enough to supply two or three cities with light, and will probably mean the saving of several thousand dollars a year to consumers in Baltimore, as a great part of the current will be brought to that city by a pole line.

The huge dam, 2,500 feet in width, is in some respects unique in the records of engineering. The power house, the bridge, the dam, the ice breaker and the tail race have been constructed along new lines, to meet the problems presented by this particular river. At Niagara, the engineers had to deal with water falling from a great height. At McCall Ferry, the fall is not so great, but the quantity of water is. Then the Susquehanna is a dangerous river, subject to sudden rises, and in the spring sending down masses of ice that would sweep away ordinary constructions. To stop this mighty rush, hundreds of thousands of stone were used in making the ice breaker. From one side of the river extends a huge wall of stone, parallel to the dam and about 100 yards above it. It cuts into the current for several hundred feet, and is joined with the dam and power house by a wall 70 feet high, which consists of six arches. The water will first strike the rock wall, that has a thickness of at least a hundred feet. Then it will swirl around the arches, and finally reach the turbines in the power house. It is calculated that this construction of granite and concrete will stop thousands of tons of ice, prevent the cakes from getting anywhere near the turbines, and send them shooting harmlessly over the dam. The construction of the dam, when seen from the bottom, resembles the crest of Niagara Falls. It bulges over from the top, then drops suddenly and curves out to the river bottom, the contour being intended to make ice and water slide over easily. The huge bulwark is 65 feet thick at the base and 55 feet high. A railroad track could be laid on the top. It will hold back the concentrated current in a lake that will be a mile wide and seven miles long. Concrete was of course the chief building material employed in the dam, and nearly all the construction machinery was operated by compressed air.

Cleaning Guns.

A new method of cleaning guns is being applied in the Bureau of Ordnance at the Washington Navy Yard. A draft of compressed air, at 200 pounds pressure, is thrown through the bore of the rifle, the draft being strong enough to blow a block of wood clear out of the bore to a distance of 12 feet or over. The system works with satisfactory results.

GERMAN ASTRONOMICAL CLOCK.

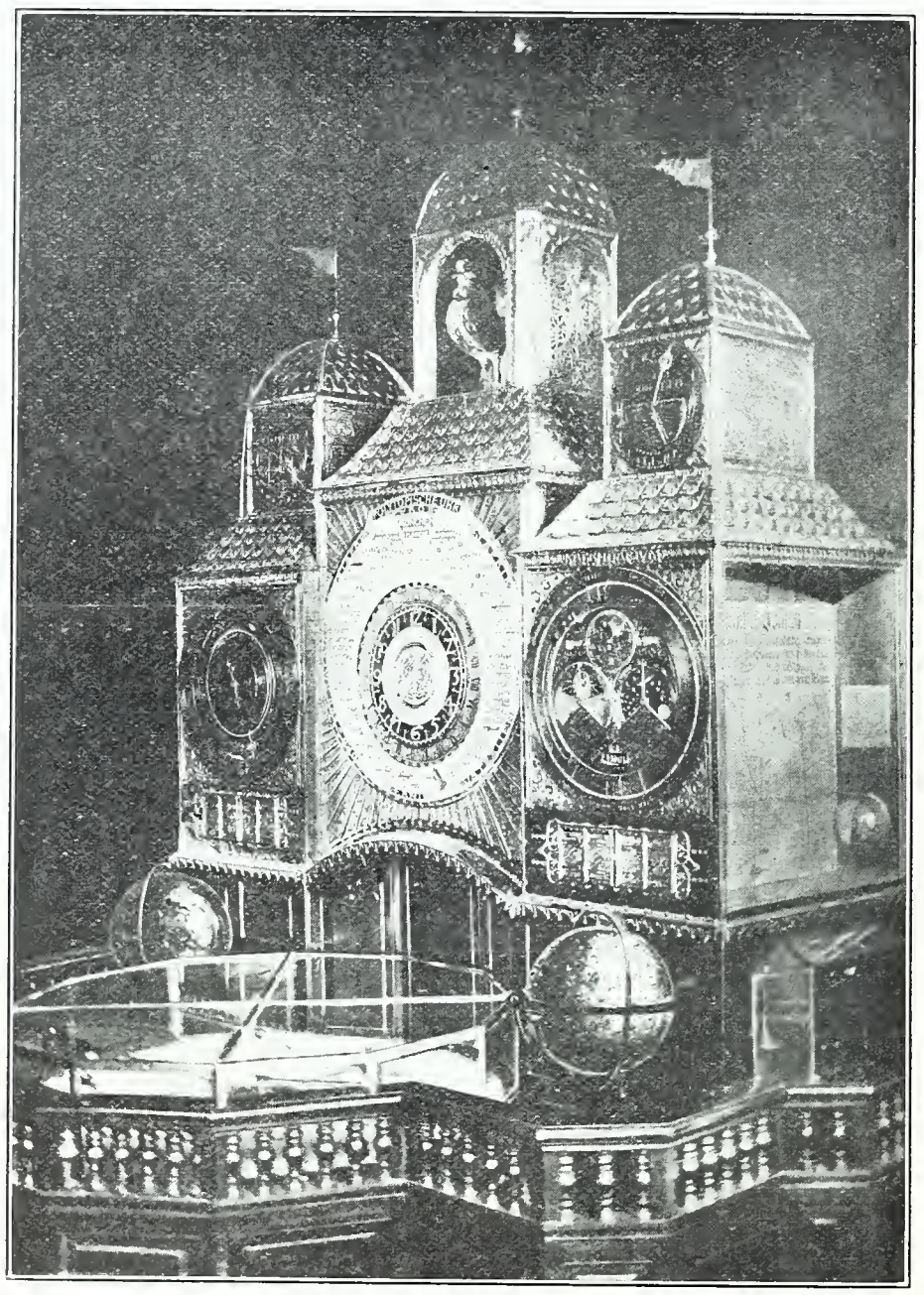
By Frank C. Perkins.

The capacity for painstaking detail of the German mind finds full scope in the construction of clocks, and marvels of elaboration have been produced in the Fatherland. One of the most recent, designed for the Munich town hall, is a universal astronomical time piece, and was constructed by Prof. Otto Hupp and Christian Reithmann, Jr., the former executing the decorative work of the clock, which is a three-tower structure, as shown in the illustration, with thirteen beautifully finished dials.

Christian Reithmann has worked on this remarkable clock more than half a decade; and in order that the works need not require future adjustment, his mathematical calculations have been carried out more than half a dozen decimal places. It is maintained that there are several hundred wheels with twenty thousand teeth required, in order that the planetarium may represent accurately the revolution of the eight main planets and their moons around the sun. The structure shows with great faithfulness the various motions of the planets and their satellites, while a tablet at the left of the mechanism gives information as to distances, orbit eccentricities and mutual position of the planets, and their relation to the sun as well as the times of revolution. It is maintained that nearly three years were required to complete the planetarium, whose elliptical orbits, non-uniform in motion, are astronomically correct. This astronomical clock mechanism requires five driving gears, the calendarium having four, and the fifth operating the remaining dials and instruments, together with the planetarium.

There are twelve parts on the central dial of the clock, with one hand indicating the mean European time and two hands showing the local time at Munich. There is a twenty-four hour clock next to this central panel, with black figures for the hours of night and white ones for the hours of the day. An exterior ring indicates the local time of the four-score principal cities of the world.

On the right of the central dial is the calendarium which shows the day of the week and month, also leap years, the movable holidays being automatically readjusted on the last day of December. The setting as well as the rising of the sun and moon are shown, also the phases of the moon, and in the upper part of the central tower a crowing cock marks the hours, as shown in the illustration.



The true solar time is marked above the calendarium on the lateral tower of the clock. Another feature of great interest is the astrolarium, or dial showing the actual position of the sun and moon among the constellations. There are several movable rings on the astrolarium dial, giving the distance of the moon, the position of perigee and the nodal position of the moon's orbit as well as other important data. The relative positions of the sun and moon are shown with absolute accuracy, and the times of eclipses as well. Another feature is a map which gives the various constellations, while surrounding this map are pictures of eminent astronomers, and below it is located the lunar tellurium. This represents the earth and moon placed in relation to the sun and to each other as in nature.

There are many other features of more than passing interest in connection with this universal astronomical clock which might be enumerated. It is hardly possible to estimate the actual or ideal value of this wonderful piece of work, but the material value of the clock will readily reach many thousands of dollars.

Cotton Picking Machine.

A practical cotton picker has long been one of the most urgent needs of the South, and many devices have been invented to satisfy the demand. None has in the past proved successful; but a recently patented apparatus is said by those who have seen it to be so entirely satisfactory in its operation, that a fortune may be predicted for the lucky inventor. The machine consists of a frame on four wheels, with two chain elevators mounted on the frame at an angle of 45 degrees. The apparatus is drawn by horses, and the forward movement is compensated for by the backward movement of the elevator chain, and these two partly reverse movements create the third or perpendicular movement for the pickers. These stroke the cotton plant directly upwards. The chain elevators are made up of a series of tubes, in each of which a picker is concealed. These pickers are shaped like a bayonet, with horsehair teeth on their edges. As the apparatus moves forward, the chain passes around the sprocket wheels, and at the bottom of the elevator a cam, placed across the chain, catches the pickers and pushes them out of the tubes into the lower part of the cotton plant. Each picker is provided at its base with a small gear wheel, which engages a toothed rack and revolves as the picker comes out of the tube. At the top of the elevator a second cam catches the pickers and forces them back into the tubes again, this movement also stripping them of the cotton and dropping it into a conveyer. The picking spindles, with their horsehair teeth, seem to search out the ripe bolls and take the lint from them, leaving the unripe and inflicting no injury on the fibre or plant. In operation, the machine straddles a cotton row and the pickers revolve rapidly through the plant from the bottom upward. The moment they touch a ripe boll they pull the cotton out.

The Inventive Age contains sound advice to inventors and patentees. For lack of such advice many have lost money. Subscription price, one dollar a year.

Forecasting Floods.

This is the time of the year when the weather bureau officials are busy preparing the country for the spring floods. This is one of the functions of that much-abused service which is not so generally known as its prediction of storm and calm. Our annual flood bill, it is estimated, is over a hundred million dollars a year. The mere menace of these floods prevents the development of thousands of square miles of otherwise valuable property, while the torrents themselves each year cause enormous destruction. A great flood means, above all things, a serious waste; and the most important item of loss is one that is generally entirely overlooked—the water itself. A conservative estimate of the value of the water lost every year places it at five times that of the more tangible results of flood damage. That is, every gallon of this wasted water is needed urgently to augment the flow of the streams in time of drought. If the flood water of the streams of the United States could be stored for future use, it would be worth half a billion dollars to Uncle Sam annually.

Most floods could be averted with intelligent effort. Although we have not yet reached that stage of progress, we have an elaborate organized system for warning the public of their imminence, so that property may be saved as far as possible. It may not be generally known that the country is divided into a number of districts, each in charge of an official attached to a weather station. These cover substations which have the practical work of river observation and the distribution of warnings. There are several hundred of these substations, which take daily readings of the depths of the rivers, the amount of rainfall in the vicinity, and the general state of the weather. So accurate is this service that floods are forecasted with a much greater percentage of exactness than is attained in the prophecies of the weather. In the great Mississippi flood of 1903—the most serious in the history of the United States—the forecasts included not only the precise date of the rising of the waters, but also the height they would attain at different points. New Orleans was warned to prepare for a depth of 21 feet, and the prediction was made nearly a month in advance, in ample time to make preparations. Cairo, Illinois, was given four days' notice of a 50-foot rise; and Memphis had a week in which to make ready for 40 feet. The warnings were heeded, and millions of dollars worth of property was saved.

River gauges—great measuring rods thrust down to the stream's bottom and extending further above the surface than any flood is likely to reach—are regularly consulted at the substations. Some of these are 200 feet in length. Snow gauges are also used in reckoning with the spring floods. This instrument consists of a 40-inch tube about two-and-a-half inches in diameter, open at both ends, and sharp at the extremity. It is driven down into the snow, and when removed, the lower end is closed and the snow is retained inside. Down the hole thus left a measuring rod is thrust, and the depth of the deposit measured. The snow in the tube is then melted and this water measured and compared with the depth of the snow on the ground. This is to estimate the quantity of water that the snow will add to the adjacent rivers when the icy crust melts and the spring thaw begins.

The engineers of the geological survey, who have been working on this problem for years, are hopeful that in time the people will not accept the ruin caused by a flood as an inevitable misfortune, but will take steps to prevent it. The ideal remedy consists in maintaining the forests, which act to retard the surface flow of water. The next requisite is the construction of reservoirs to hold surplus water until seasons of deficiency. The ultimate cost of such conservation will be nominal compared with the incalculable benefits conferred.

Armored Doors for Fires.

Within the last few years a great change has been taking place in the materials employed for the construction of fire-resisting doors. Formerly, says our consul at Manchester, it was supposed that these doors must be made of iron and steel, and although doors made of these materials were often found useless, owing to their liability to buckle, and consequently to tear themselves from their fastenings when exposed to extreme heat, it is only comparatively lately that a really effective substitute has been discovered.

Although the iron door is still made use of occasionally in various classes of buildings, one finds that in structures designed for manufacturing purposes, and especially in textile factories, the armored door is rapidly taking its place and giving satisfaction. This type of door is constructed of several thicknesses of well seasoned pine boards, planed, tongued and grooved, and nailed together with wrought-iron nails, driven flush, and clinched on the other side. The wood is then completely covered with tinned-steel sheets, each sheet being of a limited size, lock jointed, and fitting close to the wood, so that while free to expand, it helps to exclude the air and cannot become detached.

By this means combustion is prevented, and it is found that an exposure of several hours to fiercest heat results only in the surface of the outer boards becoming slightly carbonized to the depth of a fraction of an inch.

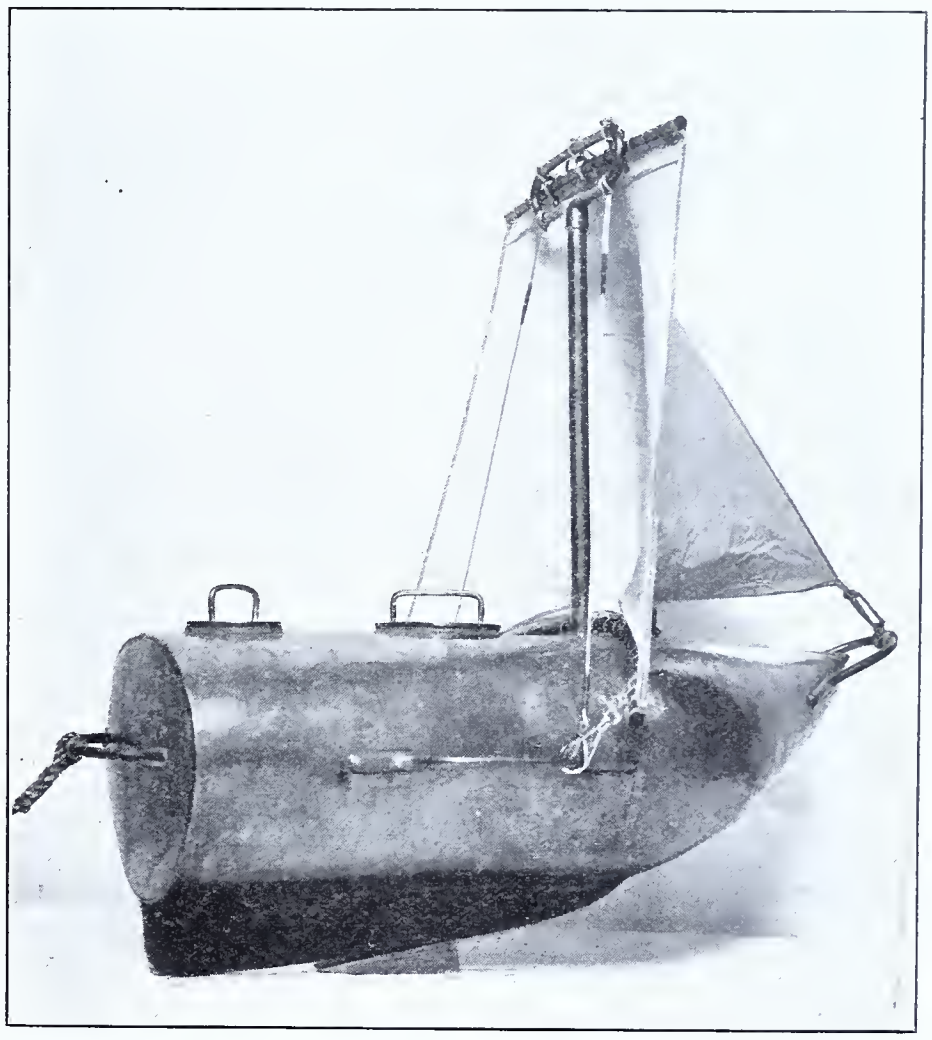
Iron Pins.

One of the consequences of the high price of copper may be that the world will soon be using iron pins, instead of brass ones. If the prices of the raw material maintain the advance of the past few years, manufacturers of pins will find it necessary to employ some other material. It will not be possible, it is said, to advance the prices of the finished articles, and they will be forced to use iron

STRANDING BUOY.

By C. VANLANGENDONCK.

A German marine engineer has recently devised a new buoy which it is believed is destined to render important services to wayfarers of the sea. The buoy, as may be seen from the illustration, has the shape of a small boat, and is made of yellow metal and copper, the frame being tincoated. It has a leaden keel tapering at both ends and of sufficient weight to keep the buoy upright under any condition, even when put upside down with the sail on. Its dimensions are: length 3 feet; beam 1 foot 6 inches; depth 1 foot, and draft 8 inches. Aft of the mast are two watertight bulkheads, dividing the interior into three parts. These divisions are large enough to hold provisions in case a ship founders in open sea and the buoy is taken within the lifeboat.



THE BREDSDORF STRANDING BUOY.

Four handgrips are fitted on the outside of the buoy for the purpose of making the line fast, as well as for fishing the buoy up with a boathook. They are also useful when the buoy is employed for life saving purposes; it can easily keep two or three persons above water. On top is fitted a watertight cover 5 inches in diameter, beside a smaller one at each end. Through these openings provisions, or the ship's papers, can be inserted into the buoy. The mast is made of brass piping formed at the top into an oblong ring, serving the purpose of staying the sail, and for taking hold of the buoy when in the water. The sail is made of strong waterproof canvas, mounted at top and bottom with yards of Spanish reed or fish bone. On the foreside the sail forms a triangular bag, by means of which the buoy is kept in the direction of the wind.

The buoy is supplied with a light Manila rope for letting it into the water. At the end of this rope is attached a long racket line wound on to a light moving reel. A bell may be placed on the afterside of the mast.

The main object of the device is that it shall serve as a stranding-buoy, which, when let overboard, will sail to the shore, where it lands. By means of the light line, a heavier rope is then brought over from the stranded vessel for operating the life saving chair.

If a pilot is to be taken on board, or a vessel wants towing assistance in the high sea or a lifeboat to come alongside, the buoy can be used to bring the line on board. It can also serve as a medium of communication between torpedo boats and warships at sea.

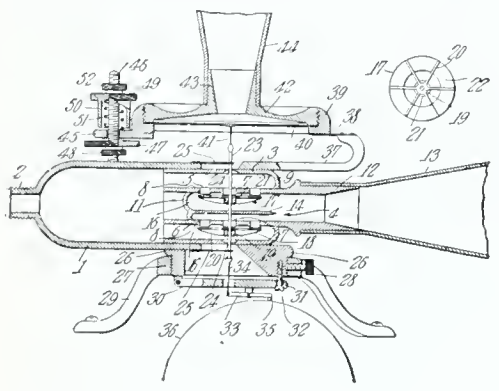
When a vessel has to be abandoned in open sea, the buoy can be taken with the lifeboat and used to store provisions and the ship's papers; and in case the crew is lost, it will carry tidings of the vessel. The buoy can be seen at a long distance through its white sail.

CLEVER NEW PATENTS.

The Multiphone.—Advertising Sign.—Ventilators for Locomotive Shops, Etc.

The Multiphone.

An interesting device for increasing the loudness of sound, invented by Nathaniel Baldwin, of Heber City, Utah, has been recently protected by letters patent. Compressed air supplies the energy for producing the intensified sound, and the instrument comprises a delicate valve which intercepts the flow of air from an air chamber into an amplifying horn, and means for operating the valve in accordance with sound wave vibrations. The result is that the compressed air issues from the horn in pulses corresponding to the original sound waves. There is thus produced a copy of the original sound, the intensity being determined by the pressure of the air, size of the valve, etc. In the



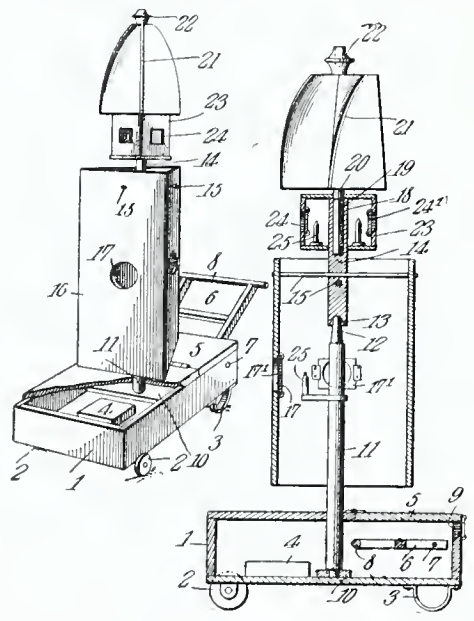
figure, 1, represents a receiving chamber from which the air passes through the double valve into the horn 13. In the walls 8, 8, which separate the air chamber from the horn are formed central circular openings 7, 7, surrounded by a number of concentric annular openings 5. The figure shows but one of these annular ports, but the best results are obtained by having a number of them, all concentric with the central opening and occupying but a small area. These ports are covered and nearly closed by valves 17. The smaller cut shows another view of one of the valves. These valves are fixed to a rod 23 and so arranged that the air pressure on one of them is balanced by tbe opposing pressure on the other. As the valve rod is carried by light springs 25, 25, and moves without friction, the slightest impulses will operate the valves. When the valve rod is connected to a diaphragm, as in the figure, and sound beats upon the diaphragm, the valves vibrate in accordance with the sound waves, and a much louder sound is given out from the horn. Used in this way, spoken words have been distinctly heard a mile away, but the range of the instrument is not limited to one mile, nor to five miles, as the sound from one valve may be used to operate the diaphragm of a second larger valve and the loudness again multiplied. Thus the multiphone is useful in speaking, singing, or playing music at long range or to very large audiences; and by using a secondary valve, spoken words may be used for locomotive signals, fire alarms, etc. Instead of a diaphragm, the valve rod may be connected to the stylus of a phonograph, as shown in the lower part of the figure. The valves then operate in accordance with the record and the instrument serves as a reproducer. With this reproducer, the phonograph plays with surprising purity of reproduction, and louder than a brass band. Of course the loudness can be regulated to the desired degree by placing a suitable shutter in the horn. The valve rod may be connected to the diaphragm or other armature of a telephonic magnet, and the instrument becomes a receiver of high power. This is the most difficult application of the device, as the vibrations of the telephone receiver are very feeble, but the inventor has succeeded in making it audible at a distance of 600 feet.

Means are thus provided for a man to sit in his office or at his home and deliver a lecture or render a musical selection to an audience in a distant city.

Further information may be had by addressing the inventor.

Advertising Sign.

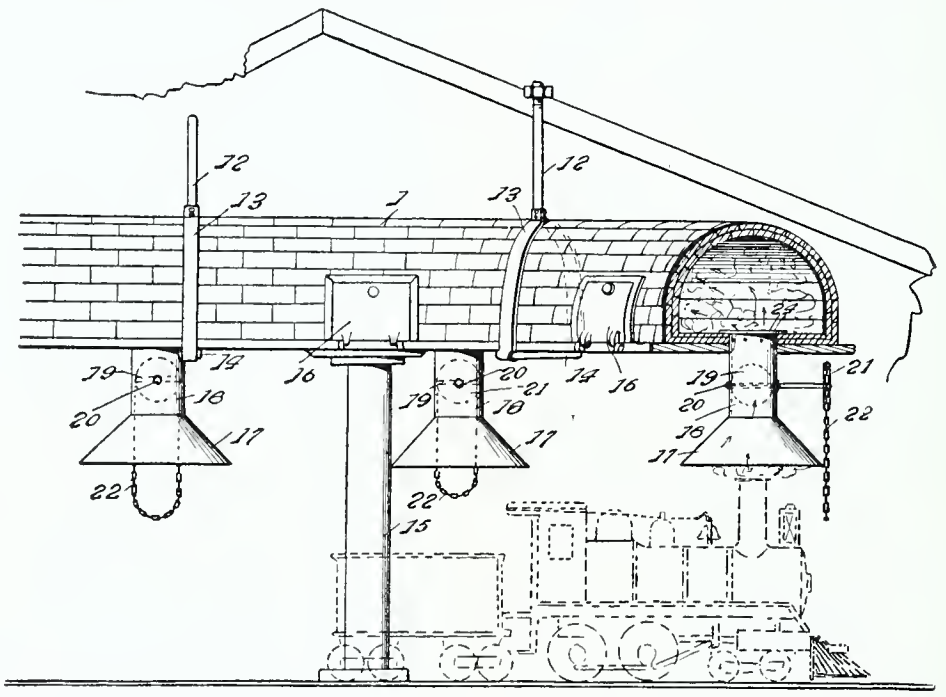
In this age of advertising, any device that will attract the attention of the public is sure of a welcome from the business world. A unique apparatus of this character comes to us from Michigan, and is the invention of Lee Harman Deaner, of Muskegon. It consists of a sign which, by a combination of movements under the action of wind, will arrest the attention of passers-by, and induce them to read the advertising matter. The device comprises a rotatable body, preferably triangular in cross section,



having a pivotal support near its upper end so constructed as to permit the advertisment carrier not only to rotate but to swing from side to side, thus giving a compound movement which catches the eye. In order that the device may be rotated, it is surmounted by a wind wheel, which, when the air is in movement is rotated by said air, and this motion is communicated to the advertisement carrier. The wind wheel is placed at a sufficient distance above the pivot support of the advertisement carrier to act upon the latter in such a manner as not only to cause it to rotate but to swing in various directions about the pivot support. When the wind strikes the vanes and rotates them upon the vertical axis, the upright bar 14 participates in such movement because of its non-circular end entering the socket 18, whereby the wind wheel and the bar 14 are united for synchronous movement. As the pivotal support for the advertisement carrier is located below the wheel, the wind striking the wheel rocks the entire structure about the pivot and also imparts a rotary movement, thus causing the device to pass through a devious path, the motion being so erratic and apparently aimless as to attract the notice of persons in the street, who stop to watch its peculiar movements and so are induced to read any legends which may be placed upon said carrier. A perforated casing 23 is mounted on the bar between the body and the wind wheel, designed to carry light-giving elements so that the apparatus becomes prominent at night, and for the same purpose, the sides of the body 16 are provided with perforations which may be covered with colored or clear glass. In the daylight, advertising matter is displayed upon the plain surfaces of the body. The supporting truck has wheels at one end and supports at the other, which overcome any tendency of the wheels to permit the truck to move; and handles are provided to convey the truck from place to place, said handles being arranged to fold within the truck and be hidden from view when not in use.

Ventilators for Locomotive Shops, Etc.

One of the problems which railway officials have been struggling with for years, is to provide some means for preventing the congestion of smoke and other products of combustion in stations, roundhouses, locomotive shops, and similar places. A device which presents a simple and effective way out of the difficulty has been patented by Joseph Larivee, of New Haven, Connecticut. It comprises a conduit 1, which may be suspended by hangers from the roof of the structure, or supported from below by pillars, and is sufficiently ele-



vated to catch the smoke, gases, etc., given off by the engines. The bottom of tbe conduit is preferably flat and its top arched, and it is connected by means of a branch with a chimney, which is subdivided to form independent passages, each of which is connected with the ends of the conduit. The branches are inclined so as to insure a draft, and have dampers adapted to be operated from the ground floor. The conduit is divided into sections, each of which is in communication with a passage of the chimney, and it will be seen that any section may be used to the exclusion of the others, and may be connected with any one of the passages. Doors 16 permit access to the interior of the conduit when it is required to clean it out. A series of smoke collectors are provided at intervals, each consisting of a hood 17 and a pipe 18, the hood being of flaring form to gather in the products of combustion. Dampers 19 in the pipes are arranged to be operated by means of pulleys and cords. The lowest portions of the smoke collectors are at such an elevation as to admit of the smoke stack of a locomotive passing thereunder, so that the smoke, gases, etc., may find a ready exit into the conduit and thence into the chimney. Since the draft is strongest through the collector nearest the chimney, it is proposed to equalize it by a progressive graduation of the openings between said smoke and gas collectors and the conduit, the openings gradually increasing in size toward the most remote collector. In shops and other places, the conduit may have straight or curved runs, corresponding to a line of forges or other fuel consuming devices from which it is desired to carry off the smoke.

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LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

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SAXLEHNER v. WAGNER et al.

(Circuit Court of Appeal, Sixth Circuit. Dec. 26, 1907. 157 F. R. p. 745.)

TRADE-MARKS AND TRADE-NAMES—UNFAIR COMPETITION — ARTIFICIAL SPRING WATER.

The proprietor of the Hunyadi Janos Springs in Buda-Pesth, Hungary, having, as determined by the Supreme Court, through laches in permitting other bitter Hungarian waters to be imported and sold in the United States under the general name of "Hunyadi" waters, lost the right to protection in the exclusive use of such word as a trade-mark, except in connection with the word "Janos," cannot maintain a suit to enjoin the sale of a water made in this country under the label "Carbonated Artificial Hunyadi, Conforming to Fresenius' Analysis of the Hunyadi Janos Springs," where it is not claimed that it does not contain the same chemical ingredients and there is no similitude in the dress; there being nothing in such name to mislead purchasers or make a case of unfair competion.

CORSER v. SWEET et al.

(Circuit Court, S. D. New York. Dec. 16, 1907. 157 F. R. p. 759.)

PATENTS—INVENTION—BUCKLES FOR OVERALLS.

The Corser patent, No. 630,037, for a buckle for overalls, consisting of a buckle for fastening the shoulder straps to the bib, having two diverging buttonhole loops for attachment to buttons on the bib, is void for lack of patentable invention, in view of the prior art. Assuming the patent to be valid, and giving it the broadest construction to which it is entitled in view of the proceedings in the Patent Office, the diverging of the loops is an essential feature of the device and the patent is not infringed by a device in which the loops are parallel to each other.

GERMER STOVE CO. v. TWENTIETH CENTURY HEATING & VENTILATING COMPANY.

SAME v. CLERKIN et al

(Circuit Court N. D. Ohio, E D. July 5, 1907. 157 F. R. p. 842.)

PATENTS—SUIT FOR INFRINGEMENT-LACHES.

Defendants obtained a patent and entered into an arrangement with complainants by which the latter, as well as defendants, manufactured under it for several years, and then complainants purchased a prior patent for a similar article. After the lapse of two years more, and within less than a year prior to the expiration of their patent, complainants brought suit against defendants for infringement. Held that, the delay having been with full knowledge of defendants' device, they were barred by laches from maintainiug such suit.

BREUCHAUD v. MUTUAL LIFE INS. CO. OF NEW YORK et al.

(Circuit Court, S. D. New York. Nov. 23, 1907. 157 F. R. p. 844.)

PATENTS—INFRINGEMENT-WALL SUPPORTS.

The Breuchaud patent, No. 563,130, for improvements in the construction of supports for walls, which relates especially to the construction of subbases for old walls when excavations are made adjoining, was not anticipated, and discloses invention and a meritorious advance in the art; also held infringed.

WARREN WEBSTER & CO. v. NATIONAL VACUUM STEAM HEATING CO.

(Circuit Court of Appeals, Eighth Circuit. Nov. 4, 1907. 157 F. R. p. 920.)

PATENTS—INFRINGEMENT—STEAM-HEATING APPARATUS.

The Donnelly patent, No. 670,893, for an improvement in steam-heating apparatus, consisting of a water valve for automatically controlling the discharge of the air and water of condensation from the radiators, which valve is operated by the difference in steam pressure between the inlet and the outlet side, held not infringed by a device operated by a float actuated by hydrostatic pressure alone.

WEIERMAN et al. v. SHAW STOCKING COMPANY.

(Circuit Court of Appeals, Third Circuit. December 16, 1907. 157 F. R. p. 928.)

PATENTS—INVENTION—STOCKING.

The Shaw patent, No. 460,037, claim 2, for a seamless stocking having a divided foot, one part knit with one yarn or set of yarns, and the other with a different yarn or set of yarns, with the edges reciprocally interlooped, is void for lack of patentable invention in view of the prior art.

STAR BALL RETAINER CO. v. STRAUSS et.al.

(Circuit Court, S. D. New York. Nov. 26, 1907. 157 F. R. p. 930.)

PATENTS—INFRINGEMENT—BALL RETAINER.

The Keiper patent, No. 686,617, for a ball-retainining device for ball bearings, as limited by the prior art, held not infringed.

ECCLES v. BRADLEY.

(Circuit Court of Appeals, Second Circuit. Dec. 6, 1907. 158 F. R. p. 98.)

PATENTS—INFRINGEMENT-THILL COUPLING.

The Bradley patent, No. 609,928, for a thill coupling, the novel element in which is a spherical leather packing, held infringed by a coupling identical with that of the patent when sold, but in making which, instead of using a packing previously pressed into shape in a mold, the coupling itself is utilized as a press for such shaping.

NATIONAL CONDUIT & CABLE CO. v. JOHN A. ROEBLING'S SONS CO.

(Circuit Court of Appeals, Second Circuit. Dec. 4, 1907. 158 F. R. p. 99.)

PATENTS—INFRINGEMENT — ELECTRIC CONDUCTOR.

The McCracken patent No. 304,539, claim 1, for an electric conductor consisting of a wire having an insulating covering of paper, is limited by the proceedings in the Patent Office during which the patentee, to meet objections made by the office, changed the claim so as to describe the paper as "spirally-wound," and is not infringed by a wire having a longitudinal wrapping of paper.

KELLOGG SWITCHBOARD & SUPPLY CO. v. INTERNATIONAL TELEPHONE MFG. CO. et al.

(Circuit Court, N. D. Illinois, E. D. Nov. 26, 1907. 158 F. R. p. 104.)

1. PATENTS — INFRINGEMENT — TELEPHONE TRANSMITTER.

The Dean patent, No. 687,499, for a telephone transmitter, the essential feature of which is the mounting of a practically weightless transmitter case upon the vibrating or main diaphragm of a telephone, and associating it with a fixed back electrode and a supplemental diaphragm, by which it is claimed that packing of the carbon granules within the chamber is prevented, and stronger and more distinct tones are produced, although not a great advance upon the prior art, discloses patentable novelty and is valid; also, held infringed.

2. SAME—VALIDITY—ABANDONMENT.

One seeking to invalidate a patent on the ground that the invention had been abandoned has the burden of proof, to establish by clear and convincing evidence an intention on the part of the inventor to dedicate the invention to the public.

3. SAME—ESTOPPEL—DELAY IN APPLYING FOR A PATENT.

The fact that a patentee, after perfecting his invention, delayed for six years before applying for a patent therefor, does not estop him from claiming priority for such patent over one subsequently issued to another, who had in the meantime conceived the same invention, but who took no steps to obtain a patent until after the first patentee had filed his application and had introduced his invention into public use.

SCOFIELD et al. v. BROWNE.

(Circuit Court of Appeals, Third Circuit. Dec. 11, 1907. 158 F. R. p. 305.)

1. PATENTS—DESIGNS—EVIDENCE OF PATENTABLE NOVELTY.

The fact that articles when made after a patented design were more salable and in greater demand is evidence that such design possesses the qualities of novelty and attractiveness to the eye, which rendered it patentable.

2. SAME — INFRINGEMENT — ORNAMENTAL HEAD FOR BROOCHES.

The Frenot design patent No. 35,922 for a design for an ornamental head for brooches, etc., discloses patentable novelty. Also held valid as against the defense of public use for more than two years, and infringed.

ARROWSMITH MFG. CO. v. E. T. GILBERT MFG. CO.

(Circuit Court, W. D. New York. Dec. 11, 1907. 158 F. R. p. 307.)

PATENTS—INVENTION—INSTEP SUPPORT.

The Arrowsmith patent, No. 748,553, for an instep support or arch prop, claims 3 and 4 are void for lack of novelty and patentable invention, in view of the prior art.

VICTOR TALKING MACH. CO. et al. v. HOSCHKA.

(Circuit Court, S. D. New York. Dec. 27, 1907. 158 F. R. p. 309.)

PATENTS — INFRINGEMENT — TALKING MACHINES.

The Berliner patent, No. 534,543, for an improvement in talking machines, claims 5 and 36 held valid and infringed on a motion for preliminary injunction on prior adjudications of the validity and scope of such claims.

BAMFORTH et al. v. DOUGLASS POST CARD & MACHINE CO. et al.

(Circuit Court, E. D. Pennsylvania. Jan. 13, 1908. 158 F. R. p. 355.)

1. TRADE-MARKS—IDENTIFICATION OF PRODUCT—POST CARDS.

Uncopyrighted post cards are not entitled to protection as trade-marks either singly or collectively, as they do not identify and distinguish the product of the manufacturer, but constitute the product itself.

2. SAME—UNLAWFUL COMPETITION.

The manufacturer of uncopyrighted post cards having no legal right to the exclusive production and sale thereof, the manufacture and sale of like cards by a rival manufacturer may not be restrained as unlawful competition.

3. LITERARY PROPERTY — UNCOPYRIGHTED PUBLICATION—EXCLUSIVE PROPERTY.

Neither a book nor a photograph can continue to be the author's exclusive property after it has been printed and offered to the public for sale without being copyrighted.

LE BROCQ v. CHILDS et al.

(Circuit Court, E. D. New York. January 11, 1908. 158 F. R. p. 412.)

PATENTS — ACTION FOR INFRINGEMENT — PLEADING—COMPLAINT—SUFFICIENCY.

A complaint in an action to recover damages for the fraudulent procuring of a patent by defendants, in the name of one of them, for an invention alleged to have been made by plaintiff, held to state a cause of action on demurrer.

LORAIN STEEL CO. v. WHITE MFG. CO.

(Circuit Court, S. D. New York. Dec. 30, 1907. 158 F. R. p. 413.)

PATENTS— INVENTION — RAILWAY SWITCH STRUCTURE.

The Moxham patent, No. 536,734, for a railway switch structure, claim 1, is void for lack of invention, in view of the prior art. Claim 6, conceding it patentable novelty, in view of its narrow range, must be limited to the precise structure described. As so limited, held not infringed.

KELSEY HEATING CO. v. JAMES SPEAR STOVE & HEATING CO.

(Circuit Court, E. D. Pennsylvania. Dec. 19, 1907. 158 F. R. p 414.)

PATENTS—INFRINGEMENT-INJUNCTION-CONTEMPT.

Where an essential element of complainant's patent on a hot-air furnace consisted in placing the rods tying the bottom plate and crown sheet through the vertical air flues which surrounded and formed the sides of the combustion chamber, an injunction restraining infringement was not violated by a furnace in which the tie rods were placed entirely outside of, and removed from, the flues.

AUTOMATIC WEIGHING MACH. CO. v. PNEUMATIC SCALE CORPORATION, Limited.

(Circuit Court, D. Maine. January 1, 1908. 158 F. R. p. 415.)

1. PATENTS—SUIT FOR INFRINGEMENT—DECISION IN INTERFERENCE PROCEEDING.

On an appeal to the Court of Appeals for the District of Columbia from the decision of the Commissioner of Patents, in an interference proceeding between two applicants each claiming the same invention, the question at issue is merely one of priority as between two inventors; but in a subsequent suit for infringement of the successful patent in which its validity is attacked, the issue is broader, and involves the question whether the patentee was an original inventor as against the public at large, wherefore the decision in the interference proceeding is not of controlling force in such suit.

2. SAME—ANTICIPATION-PRIOR DISCLOSURE OF INVENTION BY ANOTHER.

Although one who was the first to conceive an invention may lose his right to a patent therefor as against a subsequent independent inventor of the same device by failing to use reasonable diligence in following up his conception, yet where he made known his invention to another and exhibited drawings, such disclosure, if of sufficient fullness to enable one skilled in the art to construct the device, completed the invention within the meaning of the patent law with full effect as an anticipation.

3. SAME—AUTOMATIC WEIGHING MACHINE.

The Thomas patent No. 766,004 for an automatic weighing machine is void for anticipation.

FOX et al. v. KNICKERBOCKER ENGRAVING CO.

(Circuit Court, S. D. New York. January 11, 1908. 158 F. R. p. 422.)

1. PATENTS—DAMAGES FOR INFRINGEMENT —ESTABLISHED LICENSE FEES.

Where the owner of a patent granted an exclusive license thereunder, authorizing the licensee to grant licenses to others on such terms as it saw fit, reserving as a royalty a certain per cent. of the profits realized by the licensee, in a joint suit by the owners and licensee for infringement which interfered with sales by the licensee and the granting of licenses, the license fee established, charged, and received by the licensee may properly be taken as a basis for the computation of damages and profits recoverable from the infringer.

2. SAME.

Where two different uniform license fees under a patent prevailed at different periods of time, the fee having been reduced on a certain date, an infringer whose infringement commenced during the first period and extended into the second may properly be charged with damages at the higher rate until he ceased to infringe; but where he subsequently again commenced infringement, his liability should be measured by the rate then prevailing.

3. SAME.

Evidence held sufficient to show uniform established license fees under a patent during the time of its infringement by defendant.

4. SAME—INCREASE OF DAMAGES BY COURT.

Where a defendant knowingly infringed a patent and continued such infringement after suit brought, taking business away from licensees by cutting prices, the case is a proper one for the court in the exercise of its discretion, under Rev. St. § 4921 [U. S. Comp. St. 1901, p. 3395], to award the complainant treble damages.

RAPP v. CENTRAL FIRE-PROOF DOOR & SASH CO.

Circuit Court, S. D. New York. January 22, 1908. 158 F. R. p. 440.)

1. PATENTS—INVENTION — COMBINATION OF OLD ELEMENTS.

That a combination of old elements in a structure may constitute invention, there must be a mental conception, a new and improved result that the ordinary mechanic skilled in the particular art could not have produced without the exercise of inventive skill.

2. SAME—FIREFROOF DOOR.

The Rapp patent, No. 653,400, for a fireproof door, consisting of an ordinary wooden door covered with metal sheets with panels, etc., to correspond to the door, their edges interlocked by means of marginal lips hooked together, discloses no feature not old in the art, and produces no new or improved result, and is void for lack of invention. Claims 2 and 3, if conceded invention, held not infringed.

MECHANICAL INVENTIONS AND DESIGNS.

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Mary A. Lipscomh, Eureka, Cal. Sheep Shears.—An object of the present invention is to provide a pair of sheep shears, equipped with adjustable blades, adapted as the cutting edges become worn at the points to be swung inwardly so as to arrange the outer effective portions of the cutting edges in proper position, and thereby compensate for the wear incident to sharpening the blades.

Thos. M. Price and Jay S. Richards, Itasca, Texas. Bundle Tie.—An object of the present invention is to provide a bundle tie, designed particularly for use on mail matter so as to enable the same to be rapidly and securely tied into packages, and as easily untied, the construction being simple and inexpensive and providing a secure tie for the package.

Thomas M. Price, Itasca, Texas. Fence Stay.—An object of the present invention is to provide a stay, adapted to he readily applied to a fence wherever desired, and capahle of maintaining the strands or line wires of a fence in relatively fixed relation to prevent their sagging, or heing forced apart by the attempted passage of an animal between them.

Thomas M. Price, Itasca, Texas. Cleaning Rod for Rifled Fire Arms.—The ohject of the present invention is to provide a cleaning rod, designed particularly for use on large and small rifled fire arms, and provided with means for swiveling a rag or swah to it, so that such rag or swah will he permitted to rotate and follow the grooves of the rifling, while the fire arm and the cleaning rod are firmly gripped at any point. It is also the object of the invention to provide a cleaning rod, adapted to permit short rapid strokes or movements, even when only a small portion of the rod is inserted in the barrel of the fire arm.

Adam C. Hendricks, Hagerstown, Md. Clutch Mechanism. Two patents.—The first invention relates to means for clutching two members against free independent or relative movement or rotation, and, while particularly intended for use in connection with the driving mechanism of automobiles and the like, it is not necessarily limited thereto, but can be successfully employed in various types of machinery. One of the objects is to provide in driving mechanism for self-propelled vehicles, clutch means that will permit the use of a continuous undivided axle, thereby eliminating the usual expensive and intricate gearing and truss employed with divided axles. It also effects a secure automatic driving connection hetween the axle and the wheels when the driving axle is operated in either direction, and will permit the overrunning of the wheels in either direction, and therefore the turning of corners or curves without undue friction.

The second patent relates to means for clutching relatively rotating parts together against relative rotation, and is applicable to a variety of structures, as, for instance, in coupling two rotating parts, or as braking mechanism to stop the rotation of a part. This invention has for its principal ohject to provide a novel mechanism which is composed of parts not liable to become deranged, of simple and inexpensive yet efficient construction; and, furthermore, being so constructed that none of the parts is subjected to excessive strain or wear. A further object is to provide a novel brake mechanism whereby an even and powerful stopping action may be applied to a wheel or other rotating part, said mechanism being enclosed and occupying very little space.

John H. Brookman, Central City, Iowa. Target Trap. Two patents.—The first invention relates to that class of machines employed in projecting aerial or flying targets commonly known as "clay pigeons." One of the objects of this invention is to provide means having inherent power independent of an operator to return the projecting mechanism to a set position after the discharge of a target, thereby heing strictly automatic in its action. It is also the ohject to provide means of a novel and simple nature for feeding targets to the projecting mechanism, said means being semi-automatic in its action and operated by the same means which accomplishes the resetting of the projecting mechanism. A still further object is to provide a trap which will not be liahle to break the targets and which will not he seriously interfered with hy such breakage when it does occur.

The second patent also relates to improvements in means for projecting clay pigeons, and has for its object to provide novel means that will more effectively and expeditiously project targets, said mechanism being controlled in a very simple and efficient manner.

Harry McCann, Hamilton, Ontario, Canada. Four patents.—The first patent relates to means for shaping and supporting plastic material, such as mortar of cement or hot concrete, in the erection of building or other walls from such material, and has for its object to provide novel box plates and novel means for assemhling and holding such plates in box form for reception of the plastic material and retaining the same in proper shape until it becomes rigid, thus producing building or other walls of any preselected design.

An improved box plate is the subject-matter of the second patent, and has for its ohject to produce a box plate having novel structural characteristics, securing a maximum of strength and stiffness with a minimum of weight in order to facilitate their organization in an extensive structure and to insure the requisite stahility of the structure when completed. A further ohject is to improve the means wherehy the rigid connection of the plates is effected and to include pressing, whereby box plates of irregular dimensions may be employed where necessary and secured to the adjoining box plates without reference to the particular location of the bolt openings in the latter.

The third invention relates to buildings having concrete or other composite fireproof walls, and more particularly to means for mounting window sashes therein, together with the necessary fittings and ornamental trimmings. One of the objects is to provide a simple means whereby window sashes may be mounted in a concrete wall without the necessity of employing complete frames of the usual character, the guides, weight boxings and the like, being firmly anchored to, and in, the body of the wall. Another ohject is to provide means whereby the usual fittings, ornamental trimmings and the like, may be firmly fastened in proper position to the wall about the window openings.

The fourth invention relates to means for securing fittings, trimmings, and finishings of various kinds to concrete walls, and has for one of its objects to provide means that is exceedingly simple in structure, and may be readily embedded in concrete and similar composite walls during the construction thereof, said means constituting devices whereby trimmings and fittings of various kinds can be readily fastened upon such walls and efficiently maintained in position. Another object is to provide means whereby door, window and like frames may be dispensed with, and the doors, windows and other structures can be mounted and hung directly to the concrete wall.

Jasper N. Rickles, Altoona, Ala. Two patents. Drilling Machines.—The first invention relates particularly to manually-operated drills for mining coal and the like in confined places, although it is applicable for use in other analogous relations. The principal object is to provide an exceedingly simple implement, which can be conveniently held and operated, and is capahle of ready adjustment in order to alter the speed. and thereby the force of the drill or driven member with respect to that of the driving members.

The second invention also relates to manually-operated drills for mining coal and the like, and has for its principal object to provide a novel and simple structure that will support the drilling mechanism and eliminate all liability of the said hody turning, said structure being adjustable to different heights in order that the drilling mechanism will he properly positioned to the seams of coal or other material to be drilled.

Joseph N. Copeland, Altoona, Ala., inventor; J. N. Rickles, same place, assignee. Picture Hanger.—An object of the present invention is to produce a picture hanger, adapted to be readily applied to a picture and capable of enahling the same to he hung from a nail or from a molding and of effectually preventing a picture from being accidentally knocked down. Another object of the invention is to provide a picture hanger equipped with means for enabling the angle or inclination of the picture to be readily changed without removing the picture from the nail or other supporting means.

Joseph N. Copeland, Altoona, Ala., inventor; J. N. Rickles, same place, assignee. Picture Hanger.—The object of the present invention is to provide a picture hanger, equipped with means for firmly gripping a molding at both the top and bottom thereof, and for utilizing the weight of the picture to maintain the clamping means firmly in engagement with the molding.

George L. Noe and Charles S. Weiland, Elko, Nev. Hinge.—An ohject of the invention is to provide a hinge, adapted to he completely concealed between a door and its casing, when the former is closed. Another object of the invention is to provide a concealed hinge of this character, in which the parts in their closing movement will interlock and positively draw the movable leaf and the door, to which it is secured, closely to the door casing to hold the hinged edge of the door against inward and outward movement.

Wakefield Phinney, Hollywood, Cal. Comb.—This invention has for its object to provide a comb adapted to fit the head, and designed for applying hair tonic and other liquid to the scalp through hollow teeth, and capable of being firmly gripped and operated with one hand both to manipulate the comb and control the discharge of the tonic or other liquid from the outer ends of the teeth.

Thomas Turner, Ottumwa, Iowa. Three patents.—The first invention relates particularly to air or fluid pressure operated mechanism for feeding pneumatic hammer operated drills to their work, and has for its principal object to provide a novel and simple mechanism, whereby the pressure upon the motor may be varied to suit different conditions of use without altering the pressure of the fluid supply, thereby securing the proper holding power in stone of different characters and in the necessarily different positions assumed hy the drill.

The second invention relates to pneumatic motors and has for its object to provide a novel and simple structure that will overcome or eliminate a number of objections apparent in the motors generally constructed, by providing an air or fluid cushion between the handle and the motor, and also by providing a novel valve mechanism requiring resistance to the hammer hefore the same may be operated. By this construction, disagreeable vibrations, shocks and jars which have been heretofore imparted to workmen, will be avoided.

The third invention relates particularly to rock drill feeding mechanism and has for one of its objects to provide a simple mechanism, whereby the pressure upon the motor may be varied to a comparatively great extent in order to suit the different conditions of use and without altering the pressure of the motive fluid. A further object of the invention is to provide a simple means, whereby the full power of the motor feeding mechanism, if necessary, can be employed to detach the drill should it become fast in the drill-hole.

Stokley D. Dills, Decatur, Illinois. Catapult.—This invention relates to catapults or bow guns, and the principal object is to provide a novel and exceedingly simple article of manufacture that can be conveniently carried in the pocket, is provided with means wherehy the projectile can be accurately aimed, and is, furthermore, provided with a means for securing the projectile actuating band thereto in a manner which will permit of the removal and replacement of a broken band with ease and expedition.

Frederick L. Robinson and John McCahe, Cheyenne, Wyoming. Sand Tracking Apparatus.—This invention relates to means carried by locomotives for delivering sand to the tracks whenever deemed desirable, to prevent slipping of the wheels. The principal object of the invention is to provide a simple mechanism which will insure the delivery of sand, is readily adjustahle to secure the proper flow of the material, is not apt to become clogged or inoperative, but may be made clean itself, and yet is so constructed that the interior parts are readily accessible whenever it becomes necessary to examine or repair the same.

Frederick L. Robinson and John McCabe, inventors, Cheyenne, Wyo. The Wyoming Track Sander Co., same place, assignee. Track Sanding apparatus.—This invention relates to sand tracking apparatus for locomotives, and has for its object to provide a mechanism which will permit the sand to he constantly fed to both the rear and forward sanders whenever the latter is used. Another object of this invention is to provide a simple form of air nozzle from which the sand is effectively excluded without interfering with the supply af air, said nozzle moreover being of a character that will permit its being cleansed without the necessity of dismantling the air connection.

Frederick H. Oehlke, Lorain, Ohio. Gas Controlling Means.—This invention relates particularly to the valve mechanism employed in water heating apparatus, and has for its principal object to provide a novel and exceedingly simple mechanism, wherein the flow of gas for heating purposes is automatically controlled by the flow of water to he heated, said mechanism being made up of parts that are readily assembled and are not liable to become deranged, though easily accessible should they become worn, injured, or inoperative from any source.

NEW PATENTS FOR SALE.

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FOR SALE—Patent No. 907,612. dated Dec. 22, 1908. Carpenter's Gages and Scribers. Cheap for cash. Address, A. Krehlik, 1909 Buckeye Road, Cleveland, Ohio. jun

FOR SALE—Patent No. 905,058. "Autosleigh." Money maker. Investigate. Address, C. Whitney Dennis, Euclid Ave., Hackensack, N. J. jun

FOR SALE—Valuable patent in medical line. Would trade or invest part in stock company. Price $10,000. Address, P. W. Shute, White Pigeon, Michigan. jun

FOR SALE—Patent No. 851,348. A patent gasoline generator torch for gasoline lamps that does away with the alcohol torch. Write C. T. Edward, Greensburg, Ind. jun

FOR SALE—Patent No. 883,624, dated March 31, 1908. Rock Digger, for clearing loose rock from farm lands, as well as for other purposes. Address, W. L. Combs, Bear Creek, Montana. jun

FOR SALE—Patent No. 907,493, issued Dec. 22, 1908. Sash Lock. A new device and good money maker. Like to sell outright for a reasonable price. Address, O. Gunther, P. O. B. 114, Kellogg, Idaho. jun

FOR SALE—Patent No 878,464 Hook and Eye. Can be ironed over or put through clothes wringer, as it is perfectly flat. Will double sale of other hook and eyes. Address, W. H. Knobloch, Erie, Pa. jun

FOR SALE—The Perfect Cistern, patented April 21, 1908. This is a useful invention and will sell well in county rights. Write for circular and particulars, H. H. Wise, Decatur, Ill. jun

FOR SALE—Patent No. 905,918, dated Dec. 8, 1908. Front Wheel Drive for Traction Engines. Address, John A. Peters, Plum Coulee, Manitoba, Canada. jun

FOR SALE—Patent No. 909,918, issued Jan. 5, 1909. An Electric Burglar Alarm which rings the alarm and shows the particular door or window being opened. Will sell outright or state and county rights. Address, John D. Wheeler, Salem, Oregon. jun

FOR SALE, or on royalty—Patent No. 902,997, issued Nov. 3, 1908. Sanitary Automatic Waterfountain for Poultry or Cattle. The fountain is closed against contamination, etc., until they come to drink, when it opens to let them drink, and when they leave it closes again. It can be operated while stationary. Address, Richard Partington, Barnesboro, Pa. jun

FOR SALE—Patent No. 898,685, issued Sept. 15, 1908. Keyless Door Lock. A substitute for lost keys and broken locks; fits any lock. It locks securely when everything else fails. No tools needed; no scratching of doors. Will sell outright or on royalty basis. Address, Simon N. Ritter, P. O. Box 323, Allentown, Pa. jun

FOR SALE—Patent No. 901,124, dated Oct. 13, 1908. Air agitating device for valve-bearing solutions, or any solution requiring constant agitation. For full particulars address, Thomas A. Ross, Selby, Contra Costa Co., Cal. nov 09

FOR SALE—Patent No. 902,746, dated Nov. 3, 1908. Self-Fastening Hook and Eye. Quickly attached. Looks much like the ordinary hook-and-eye. A certain success. Outright for $2000 or state rights. Address, H. N. Legan, 677 South Pennsylvania St., Denver, Colorado. jun

FOR SALE—U. S. Patent No. 864,792, issned Sept. 3, 1907. Meek Window Ventilator. Is attached at top of upper window sash and provides against down draft. The wind entering the room is directed to ceiling, and protects window curtain and shade. Is easily manipulated. Will sell at reasonable price. If interested, write for descriptive booklet and testimonials, A. S. Meek, Washington, Iowa. jun

FOR SALE—Newly patented nut lock washer. A perfect locking device. Great money maker. Write for free sample. Address, Frank Matoushek, Gregory, South Dakota. my

FOR SALE—U. S. Patent on a non-refillable bottle. No. 898,575, patented Sept. 15, 1908. For sale at reasonable price, or let on royalty. Send 10 cents to the publisher of "Inventive Age," (giving this patent number) for a copy of the patent giving full description of same, or write to me for particulars in the matter. Reuben R. Graves. R. F. D. No. 3, Box 35, Salem, Oregon. apr

FOR SALE—U. S. Patent No. 904,012. Detachable tool handles. Address, Henry F. Pocan, Marinette, Wisc. apr

FOR SALE—Patent No. 905,059. A simple foldable lace curtain stretching and drying frame; works automatically; is neatly folded; can be made quite cheaply. Will sell reasonably for cash or on royalty. Address, Peter J. DeVries, Hull, Iowa. apr

FOR SALE—Patent No. 797,887. Pail Cover. For cash, or cash and royalty. Address, C. F. Dibble, Rochester, Minn. apr

FOR SALE or royalty.—Patent No. 902,128. Land marker for corn planters. Self-lift. Address, Elmer Youtz, Casner, Ill. apr

FOR SALE—An entirely new idea of a swing for amusement. Address, Fred Wieferich, No. 336 High School Ave., Council Bluffs, Iowa. apr

FOR SALE—Patent No. 899,878. Reaper. Under shop or royalty plan. Offers to be considered before March 1, 1909. Address, T. E. Lind, Moose Jaw, Sask., Canada. apr

FOR SALE—Patent No. 896,619, dated August 18, 1908. A feed bag that does away with the waste of grain. Will sell reasonably. Address, L. M. Burke, Lay, Colorado. apr

FOR SALE—Patent No. 885,216. A mail pouch deliverer and receiver. Easy to manufacture. Made of piping. Will sell cheaply if at once. Need the money on other patents. Address, John Anderson, Box 265, Waurika, Okla. apr

FOR SALE—Patent No. 901,396, dated October 20, 1908. Car truck for street or trunk roads; will sell all or part; or will consider proposition to manufacture and market. Address, Richard Smith, Lock Box, 313, South Broadway Station, Denver, Colorado. apr

FOR SALE or on royalty—U. S. Patent No. 895,940. Envelope. Cannot be opened without detection. Contains two separate pockets. Cannot be detected from an ordinary envelope when sealed. Address, William P. Ballard, Wallowa, Oregon. apr

FOR SALE—Patent No. 901,407. Grave Attachment. Has mirrors arranged in a novel manner so that the face of the dead may be viewed from outside the grave. Address, George H. Willems, Roanoke, Ill. apr

FOR SALE—Patent No. 901,325. $5,000 will secure an active or silent one-half interest in an up-to-date toy that will return investment on first year's sales. Will sell outright for $8,000. Act quickly. Address, William H. Davis, Federalsburg, Md. apr

FOR SALE—Patent No. 899,675, dated Sept. 29, 1908. Attachment for ironing boards; an article that is wanted by every house wife; will sell outright at reasonable price; have not means to manufacture. Address, Joseph Michael, 446 North Railroad St., Pottsville, Pa. apr

FOR SALE—Automatic Show Case. Can be made in several sizes, Adapted for fountain pens and jewelry especially. Convenient and simple. Will sell cheaply if taken at once. Address, L. Peters, Marinette, Wisc. apr

FOR SALE—Patent No. 904,706, dated Nov. 24, 1908. Mink and muskrat trap. Best trap on market. Will catch as many as seven rats at one time. No lost rats or broken legs. Make me an offer. Write. B. A. Mastenson, Route 2, Ortonville, Minn. apr

FOR SALE—On account of poor health, my Friction Clutch Pulley, Patent No. 654,162, 1900, and Lamp Attachment No. 908,015, December. 29, 1908. Send for circular, Fred L. Kuhn, Fitchburg, Mass. my

FOR SALE—U. S. Patent No. 891,036. Self-Ejecting Penholder. Slight pressure on upper end ejects broken or damaged pen from holder. Address, Edward Browning, Boone, Iowa. my

FOR SALE—Patent No. 905,141, dated Dec. 1, 1908. Terminal Insulator. Simple, practical and easily manufactured. Correspondence solicited with manufacturers of electrical devices. Address, L. L. Bogue, East Orwell, Ohio. my

FOR SALE—Patent No. 903,822, dated Nov. 10, 1908. Hen's Nest. Will sell outright or by territory. A necessity for every farmer. Address, James Kirkham, Newton, Jasper County, Ill. my

FOR SALE—Patent No. 905,781. Improved Telephone Receiver. Address, Nathaniel Baldwin and Wm. Witt, Heber City, Utah. my

FOR SALE—Patent No. 817,190. Wire Stretcher and Splicer. Simple; easy to operate and manufacture, and what all wire fence owners want. Address, George W. Riker, Russell, Iowa. my

FOR SALE—U. S. Patent No. 876,033. Lantern Attachment. For elevating the lantern to different heights. A very useful device especially for farmers and mechanics. Address, L. D. Whiting, Milldale, Connecticut. my

FOR SALE—A patent machine for rowing a boat. Always in order. Safe for a child. One man can do the work of three men. Will dispense with oars. Address, Harvey T. Schweers, 524 Howard St., Petaluma, Cal. my

FOR SALE—U. S. Patent No. 873,893, issued Dec. 17, 1907. Canadian Patent No. 113,268, issued July 28, 1908. Improvements in Bag Holders. Will take the first reasonable offer. Address, Otto A. Pust, Holloway, Minn. my

FOR SALE—U. S. Patent 904,019, dated Nov. 17, 1908. Automatic Wire Stretcher. Works on new principle. Simple and effective. Desire to sell outright. A bargain if sold quickly. Address, Earnest F. Schuster, Geneva, Nebr. my

FOR SALE—U. S. Patent No. 906,351, dated Dec. 8, 1908. Planter used for planting almost every kind of seed at predetermined intervals. Send for copy of patent and terms. Address, A. A. Wofford, Statham, Ga. my

FOR SALE—Patent No. 904,498. An attachment to be used on all kinds of farm implements in tilling the soil. Reduces cost from 25 to 50 per cent, and gives better service. Address, John Pierson, Ingersol, Okla. my

FOR SALE—Patent No. 896,030. Improved Singletree for use in orchards, vineyards, hop yards, etc. No trees or shrubs destroyed where this singletree is used. Will sell like hot cakes in fruit-growing localities. Write A. E. Levins, Vernon, B. C., Canada. my

FOR SALE—U. S. Patent No. 903,582, dated Nov. 17. 1908, Canadian Patent No. 110,664, dated March 14, 1908. Improved Toaster. One lady writes, "I find it one of my most useful household utensils." Costs 5 cents. Retails for 35 cents. Address, J. J. Frith, Boissevain, Manitoba, Canada. my

FOR SALE—U. S. Patent No. 902,576 and Canadian Patent No. 112,536. Collar Stay. A very useful thing. Cheap to manufacture, and great seller. Can be used on any coat. Any reasonable price will be accepted. For description and drawing, address, H. C. Gustafson, R. F. D. No. 1, Box 20, Souris, N. Dak. my

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Conditions in the Patent Office.

The report of the Commissioner of Patents for the calendar year 1908 emphasizes the improved conditions in the Office due to recent reorganization, and to the increased appropriations granted by Congress last winter. An advance was made in the salaries of officials all along the line, with the result that the tendency on the part of the principal and assistant examiners to seek more remunerative employment on the outside, has been somewhat checked. The work in the several divisions of the Office is more nearly up-to-date than it has been for years, and with the present force it is hoped to be possible to act on the average application for patent within thirty to sixty days after it is filed. The establishment of the new classification division will enable the officials to classify all the United States patents, which now number upwards of a million, and the two million foreign patents. This, it is predicted, will lessen by one-third the work and expense of examination, and will cause patents issued in the future to have a greater degree of validity. This system of classifying technical subject matter, it may be noted, is quite perfect in Germany and England.

The report urges the passage of a bill before Congress, which provides for the elimination of one of the three appeals now provided by law in the practice within the Patent Office. The burden of this great number of appeals has been continually complained of by those who have felt its weight and borne the consequent expense. Another measure before the House of Representatives provides that appeals in trademark cases, now taken direct to the Commissioner, shall hereafter be taken to a new board of appeals, to be created by the bill just above mentioned. The passage of this measure would mean a great saving of time and labor to the tribunals of the Office, and would expedite business and enable inventors to obtain their patents without undue delay, as under the present system.

The report further urges legislation toward the establishment of a patent bar. It is suggested that a law be enacted providing that before an individual be permitted to practice before the Patent Office, he shall be required to pass an examination as to his moral, legal and technical qualifications; and that a committee shall be appointed composed of Patent Office officials and patent attorneys of well known standing, who shall conduct the examination under the direction of the Commissioner.

The treaty between the United States and Japan, recently enforced, has been of great value to the inventors and manufacturers of the United States, as it affords protection to American patents and trademarks not only in Japan, but in Korea and China. The report expresses the hope that in the near future treaties with the leading commercial nations may be consumated, embracing reciprocal provisions which will relieve inventors and manufacturers from the necessity of working their inventions in the respective countries.

Another bill before Congress provides that there shall be required to be filed with an application for patent, in addition to the drawing, two photographic copies of such drawing. The object of this is to guard against unauthorized changes in the original drawing, or abstraction of the drawing and substitution of another, as was done in a recent notorious instance, reference to which has several times been made in these columns. Another purpose of this requirement is to lessen the danger of serious mistakes on the part of the Office, in failing to detect interferences between copending applications for the same invention. It is proposed to accomplish the first purpose by causing one of the photographs to be filed in the archives, to serve as a permanent standard of comparison with the drawing. To quote from the report:

"The drawing may be sent to the attorneys' room upon request of any one appearing of record as having an interest in the application, or it may be changed or abstracted and replaced by any corrupt employee of the Patent Office, leaving no evidence, or at best mere negative indications that any unauthorized changes have been made. An illuminative example of what unauthorized changes may be made is found in the case of the Heany patent No. 872,936, where no drawing was filed originally with the application, but one was filed subsequently, which was later abstracted and replaced by another of entirely different character, the last drawing being the one which now forms a part of the patent. If at the time the Heany application was filed all applicants had been required to file a photographic reproduction of the drawing, the changes could hardly have been made without detection, except by the collusion of two or more persons, and with great difficulty.

"It is proposed to accomplish the second purpose by retaining the second photographic copy of the drawing in the file-wrapper and sending it with the file to the attorneys' room upon order, or to any other division or any tribunal of the Patent Office, when required, leaving the original drawing in the examining division, where the application is classified for examination; or, if for any reason it should become necessary to send the original drawing out of the examining division, the photographic copy would be retained therein, where it would be discovered in interference searches. Under the present procedure both drawing and file-wrapper are sent out of the division on attorneys' orders, also when they are placed in interference or are appealed; and the drawing is frequently sent out on orders of the Official Draftsman or the Chief of the Copy and Manuscript Division for extended periods, amounting, in interference proceedings, to years. While the drawing is out of the examining division, interferences between the application of which it forms a part and other subsequently filed applications may be overlooked, as the interference search is made by means of the drawing. The memory of the examiner cannot always be relied upon to recall interfering applications, especially as the personnel of the force changes continually. * * * * * * The recent developments in the Patent Office in regard to the tampering with patent records make it essential that the statute be amended as requested, so as to give statutory authority to the requirement of the photographic copies. It may be said, however, that this is the first time that the records of the Patent Office have been tampered with during its history covering a period of one hundred and eighteen years, and it is the only patent so tampered with in more than nine hundred thousand patents which have been granted by the United States to date."

The New Copyright Law.

The new copyright law which was passed in the closing days of Congress, after a fight extending over a period of years, is a broad and comprehensive measure, the general effect of which will be to add dignity to the copyright office, and tend to place the law itself almost on a par with that relating to patents. The powers of the copyright office have been widely extended, and there is a material increase in the scope of the laws, including the fixing of penalties for non-compliance. The owners of copyrights are given rights not possessed under the old statutes, and the law as a whole is brought abreast of the decisions of the courts. Clearly defined safeguards against illegal reproductions are now afforded writers, artists, designers, photographers, and also musicians. An entirely new field is covered by the provisions relating to "canned music" and to lectures, sermons, etc., in oral form. Heretofore, when a man has desired to protect a speech against reproduction, it has been necessary for him to have it printed, either singly or in connection with other addresses, and copyright the whole. Now it suffices for him to send a copy—in manuscript, if that is most convenient—to the copyright office. The same is true of musical compositions, photographs, etc., it being understood that if the work is later reproduced for sale, the copies prescribed by law must then be filed.

The question of "canned music," or the use of musical compositions upon mechanical instruments such as graphophones, pianolas, etc., has been settled by permitting manufacturers to use the records upon payment to the owner of a royalty of two cents on each part prepared, except in case of public performance for profit. This provision does not include coin-operated machines, unless a fee is charged for admission to the place where such rendition occurs. It is worthy of note that the amount of the royalty is specified, instead of being left to agreement between composer and manufacturer or publisher, as has been the precedent. It is also provided that whenever the owner of a musical copyright has used or permitted the use of the work upon mechanical instruments, any one may make similar use of the work on payment of the royalty. This act, it should be observed, is not retroactive, and includes only compositions published after it goes into effect, which will be on July 1, 1909; and it does not include the works of foreign authors, unless their country grants reciprocal rights to citizens of the United States.

Another provision gives the owner of the copyright the right to translate his work, to dramatize or novelize it, or to arrange or adapt it in any way. Under the old law, it was necessary to reserve dramatic rights, and others of a non-specified character. The law classifies the works for which copyright protection may be claimed, as follows: (*a*) books, including composite and cyclopaedic works, directories, gazetteers, and other complications; (*b*) periodicals, including newspapers; (*c*) lectures, sermons, addresses, prepared for oral delivery; (*d*) dramatic or dramatico-musical compositions; (*e*) musical compositions; (*f*) maps; (*g*) works of art, models or designs for works of art; (*h*) reproductions of works of art; (*i*) drawings or plastic works of a scientific or technical character; (*j*) photographs; (*k*) prints and pictorial illustrations. Charts, formerly specified, are now omitted, but will doubtless, according to their character, be classed as drawings of a scientific or technical character. It is provided that no error in classification shall invalidate the copyright—a matter formerly adjusted by the courts under common law.

An important section relates to the filing of copies of the work. Although it has always been required that two copies of a book, etc., should be sent to the Library of Congress after it had been published, there was no way of enforcing this provision, and it was frequently disregarded. The statute now demands the prompt deposit in the copyright office of two copies of the best edition then published, and in case of failure to comply within three months, the owner of the copyright is liable to a fine of $100, and must pay to the Librarian twice the amount of

the retail price of the best edition of the work, and moreover, the copyright becomes void. The sending of these copies is facilitated by the fact that it is not necessary to pay postage upon them. An author needs only to wrap up his books and give them to the nearest postmaster, who gives a receipt therefor and mails them to their destination without cost to the sender.

Newspapers which print copyrighted photos without permission will hereafter be liable to a fine of from $50 to $200, as well as possible damages. In the case of a lecture or sermon, $50 may be charged for each infringing delivery; for a dramatic, choral or orchestral composition, $100 for each performance, and for other musical compositions, $10. There will be no objection, however, to the performance of religious or secular works such as cantatas, oratorios and the like, for charity or for educational purposes, provided that it is not for profit.

The section relating to ad interim protection is also new. It permits a book published abroad in English to secure temporary protection, if a copy is filed within a month after foreign publication, the object being to permit time for the publication of the work in this country. It is no longer necessary to mark works of art, photographs, etc. "copyrighted." It will suffice to place upon them the letter C inclosed within a semicircle, thus: C), accompanied with the initials or symbol of the proprietor, with his full name on some part of the work. The law also provides that after the first term of 28 years, a renewal may be had for 28 years longer, instead of 14 as under the present statute, making the period of protection 56 years.

Quarrying by Machinery.

Marvelous new methods for sparing labor are now being used in the extraction from mountains of marble, granite, etc., and blocks regardless of size are quarried. The system, which is called the lifting process, is being employed with remarkable results in the granite quarries of North Carolina. It has been the practice, in the past, to drill a series of holes in the rock and blast off rough blocks in a hit-or-miss way, which necessarily involved considerable waste. The new method enables huge horizontal slabs, acres in extent, to be split off at one operation. In doing this, a hole is drilled down into the rock to the depth desired for the slab, and then small charges of explosives are set off at the bottom of this hole. Gradually a horizontal crack is formed at that point, and this crack spreads wider and wider with each explosion. After a time compressed air is forced into the hole, and this follows the split and keeps extending it until the whole slab is riven off. This slab can then be divided up into smaller blocks, to suit any purposes required.

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The Wireless Typewriter.

The latest marvel of electrical ingenuity is the wireless typewriter. In appearance, it resembles the conventional machine whose name is a commonplace in commercial houses all over the world, except that the keyboard is hidden by a small box, connected to an unimportant looking machine on a glass case near by. From the ceiling depends a short length of bamboo rod from which projects radial wires, looking like a pre-historic umbrella frame. This is the aerial which gathers the electrical impulses dispatched from another machine at some other point, and conveys them through small wires leading from the antennae to the coherer and receiver standing beside the typewriter. The whole, however, is so conventional in appearance that it gives the observer a shock to see a message suddenly printed before his eyes, apparently from the inner consciousness of the apparatus. The device is the invention of Knudsen, a Danish engineer whose system of transmitting pictures without wires has attracted general attention. His is not the first attempt that has been made to write across space without wires, but it is the first wireless typewriter brought within the realms of practicability. To strike a letter on a machine in San Francisco and to have the electrical impulse discharged into space cause the same letter to be printed in Boston, has always been considered impossible, except with apparatus that would be too costly for practical use. Experts have declared that this end could be accomplished only by an extensive system of tuning—that is, each letter must have a distinctive and individual wave length, that of "a" being sufficiently different from "b" to make it impossible for the receiver to imprint any other letter than the one dispatched. It will be readily seen that this would involve a complicated system. But Mr. Knudsen does not employ tuning at all; he substitutes a simple system of synchronization. The apparatus consists of a receiver and a transmitter, both of the same dimensions and practically alike. A shallow box with glass sides contains the accumulator driving the electric motor. The latter is mounted on the underside of the lid of the glass case, while the outer surface of this lid carries the transmitter or receiver. The machine itself is simple in design, and calls for no special skill in operation There is a small square deck carried on four columns, raised a few inches above the wooden lid. A shaft extends from one corner column to its opposite neighbor, giving two revolving parallel shafts, front and back respectively. The outer ends of these shafts carry small drums or pulleys mounted rigidly thereon. The rear shaft drums are slightly wider than the front ones, in order to carry the belt extending through the lid of the box to another pair of pulleys on the main shaft of the electric motor beneath, so that an even, steady drive of the rear shaft from both ends may be insured. Around the fore and aft pulleys on each side runs a flexible steel belt, perforated every few inches with small holes. On the peripheral surface of the drums are placed at intervals corresponding to the perforations, on the band, small teeth projections, which engage with the band perforations so that the band is given a certain gear-like drive, thereby obviating the tendency toward slipping. The two carriages are spaced equidistantly and carry a small contact piece which projects downwardly toward the table. The arrangement of these travelers upon the band is such that while one is rounding the curve in its descent, its fellow is just rounding the opposite upward curve round the drums in its ascent, ready to traverse the table. When in motion, therefore, these two carriages continually travel in one direction from front to back over the top of the table, returning on the underside thereof.

In the clear space between the traveling bands and front and back shafts is placed the keyboard. At its rear is a narrow contact bar, centrally pierced with circular slots at those points immediately above the middle line of the keys below. In these slots rise and fall vertical pins, their movement being secured by the manipulation of the keyboard. When a letter is struck, the rear end of the key in rising toward the contact bar forces the brass pin up through the slot corresponding to the letter, the pin being held in its vertical position by a small spring. By this action the pin projects less than a quarter of an inch above the level of the contact bar, and consequently offers a certain obstacle to anything that may pass directly over it, such as the depending contact piece of the traveling carriage. When the latter moving contact piece strikes this projecting pin, the electric circuit is completed; there is a spark and the impulse is discharged via the antennae into the atmosphere, to be picked up by the receiver where the letter thus caught is only printed by the typewriter.

The operation of the receiver is entirely automatic, and it is a wierd experience to follow the effect of the arriving impulses and the electro-mechanical movement of the typewriter keys, printing with unerring accuracy and monotonous regularity the letters dispatched from the distant transmitter. There is a table mechanism similar to that of the transmitter, with endless bands and traveling carriages. The latter, instead of having a projecting contact piece which strikes projecting pins, has a sliding contact piece or brush. Instead of the contact bar with its slots and rising and falling pins, there is a bar in which are inlaid narrow strips of metal, insulated from one another, over which the brush of the carriage passes continuously. These flush contact pieces are set in the same sequence as the pins of the transmitter in alphabetical rotation, so that the position of the receiving contact for any letter is identical with the contact pin of the sending instrument. From each of these strips extends a wire to the box of magnets set upon the typewriter keyboard, and by means of which the type keys are depressed and the corresponding letter recorded upon the paper.

The success of the apparatus is wholly dependent upon synchronization, where the vital parts of the two machines are in identical positions at one and the same time. In order to ensure this harmony, a novel device has been evolved. When the traveling carriages of both the transmitter and receiver have traversed the table, they come into contact with an electric stop, which arrests their progress. Then a signal is flashed from transmitter to receiver, and both carriages re start simultaneously from identical positions. It will thus be seen that it is impossible for the receiver carriage to lag behind, nor can the synchrony be interrupted without stopping the machines. Such is the simplicity with which Knudsen has solved the problem of enabling a letter impuse sent out from one machine to be received, and the correct letter infallibly selected and recorded by another, without any other means of communication beyond the air.

Radium for Disease.

Interesting accounts of cures through the use of radium have come from England, where it has been used in hospitals for a variety of ailments. The surgeon to the King, Sir Frederick Treves, says that it is almost uncanny to see the rapid manner in which the healing is sometimes accomplished in skin diseases. A few days after the first application the skin becomes red and a crust forms, which passes off in a couple of weeks. About a month later there is a second application of the radium, and in many cases the patient needs no further treatment. He cited cures of tumors, birthmarks, moles, eczema, ulcers, and the like. One of the greatest uses of radium in the future, he pointed out, might result from its curious emanations. While it is not yet safe to rely upon these cures as establishing a standard, they are very suggestive and hopeful. It is conceivable that lung diseases may some day be found curable by the inhalation of a radioactive emanation. In this connection, it should be noted that recent experiments on the Continent have shown that the gas emitted from radium has the same qualities as the radium itself, and is the chief curative factor in the various mineral waters employed in the treatment of disease. This applies especially to skin eruptions and to rheumatism. It has been found that the mineral waters lose the radium gas in transportation, and after a long series of experiments, a method has been discovered for charging distilled water with radium gas, through a comparatively inexpensive apparatus placed in drug stores, hospitals, etc. This enables patients to secure this healing water for drinking or bathing at their homes, without the necessity of visiting the expensive baths. A small piece of radium is placed in this device and the rays permeate distilled water for a short space of time, when the water is drawn off and used for drinking or bathing, as prescribed by the physician.

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Ratchet-wrench.....G. Baldwin
Ratchet-wrench, Combination.....F. E. Walden
Razor, Safety-.....P. H. Unsinger
Refrigeration system.....R. F. Massa
Refrigerator.....G. Mey
Registering mechanism.....F. L. Cross
Resilient wheel.....A. F. Glaser et al
Respirator and inhaler, Combined.....H. Brat
Retort.....R. Bennett
Reversing mechanism.....H. A. Budde
Rim-engaging device.....H. T. Andrew
Riveting-machine.....G. Ermel
Rotary engine.....L. L. Lewis
Rotary engine.....C. Ford et al
Saddle, Top-roll.....E. Dixon
Safe-door.....J. M. Allen
Safe structure.....G. A. Hattersley
Sanitary appliance.....H. G. Brott
Sash-chain guide.....U. G. McQueen
Sash-fastener.....E. L. Thompson
Sash-holder.....G. A. Dowling
Sash-operating device, 2 pats.....L. Barbieri
Saw, Inserted-tooth..J. A. and G. H. Aupperle
Sawmill-dog.....H. M. Lofton
Scene-shifting mechanism.....H. Roberts
Screw, Jack-.....J. H. and J. W. Hartley
Seal, Bag-.....E. J. Brooks
Seal, Snap-.....E. J. Brooks
Seat, Convertible cushioned and non-cushioned.....H. G. Barrett et al
Sectional stand.....F. G. Grimler
Seeding-machine automatic adjuster, 2 pats.....H. F. Deterding
Seeding-machines, Means for operating furrow-openers of.....H. F. Deterding
Sewer-construction block.....C. H. Slocomb
Sewing lasting-machine.....W. Gordon
Sewing-machine belts, Means for and method of displaying.....J. H. Boye
Sewing-machine spool-holder.....L. Schrieber
Sewing-machine thread-controlling mechanism.....W. M. Ammerman
Shade-bracket, Extension.....C. H. Luening
Shade-roller attachment.....J. V. Washburne
Sharp pad, Attachable.....S. P. Cleary
Sheet-delivering mechanism.....R. Miehle
Sheet-feeding-machine controlling mechanism..B. Gustafson
Sheet-feeding-machine pile-elevator.....B. Gustafson
Sheet-metal piling, Interlocking....S. T. Fiero
Sheet-piling.....A. A. Friestedt
Sheet-piling and means for driving or sinking the same.....F. W. Skinner
Sheet-piling or other structural elements, Locking the joints of adjacent units of.....F. W. Skinner
Shock-absorbing apparatus.....W. H. Son
Shoe-lace fastener.....J. W. Knause
Shoe-lace snap-fastener.....H. S. Shafer
Shoe-lining.....J. Mitchell
Shoe-protector.....A. Lendgren
Show-case.....A. C. Ucker
Shredding-machine.....W. B. Caminade
Shuttle.....W. F. Clayton
Sickle.....J. A. Henry
Sign, Electric-lighted.....C. F. Ziegler et al
Sign, Illuminated.....M. Norden
Signal-alarm, Automatic.....P. A. Brown
Signal system, Electric.....V. L. Beeman
Skinning and dissecting knife....F. L. Putney
Skirt.....W. and S. Epstein
Smelting, Pyritic.....J. T. Carrick
Sodium carbonate, Manufacture of hydrated...W. E. Ridenour
Solid matter and liquids, Agitating and separating mixtures of.....J. T. Carrick
Sound-reproducing instruments, Attachment for the horns of.....O. G. Rose
Spanner or the like.....P. G. Tacchi
Speed-changing mechanism.....B. Gmür
Speed mechanism, Variable-.....P. N. Ramsey
Spinning-machine weight-strap.....E. Dixon
Spool-holder.....S. Wertheimer
Spraying apparatus.....E. H. Lamiell et al
Spraying appliance.....J. C. Ryan
Spring.....F. B. King
Spring-motor.....H. Schröder
Sterilizer and irrigator, Combination.....M. H. Evans
Stockings, Knitting.....J. Black
Stone or concrete post mold, Artificial-.....O. Dougherty et al
Stove auxiliary heater.....W. Pett
Stove, Hot-blast.....J. I. Larimer
Stovepipe.....J. T. Rider
Strands with viscose, and the article, Applying and treating.....L. M. Chorier
Strata, such as muck, sand, &c., Device for sinking through soft.....A. B. Dowell
Street pavement or roadway.....A. E. Schutte
Sulfur-burner, Agitating..J. C. Wise. (Reissue.)
Sulfur from sulfur-bearing gases, Recovering, 2 pats.....P. S. Smith
Swivel, Chain-.....A. J. Pollock
Syrup, Apparatus for the manufacture of simple.....S. T. Hensel
Tack-pulling machine, Insole-..W. F. Reulmann
Talking-machine mechanism.....H. Sheble
Talking-machine sound-box.....T. Kraemer
Tape-applying mechanism.....M. B. Diskin
Telephone attachment.....A. W. Lyda et al
Telephone-cord protector.....E. T. Banes
Telephone repeating apparatus and circuit.....J. J. Skidmore
Telephone system.....W. W. Dean
Telephonic receiver.....A. H. Nicholson
Temperature-regulating device....W. W. Curtis
Thermostat, 3 pats.....E. W. Comfort
Thermostatic instrument.....C. S. Johnson
Threshing-machine.....E. M. Peterson
Ticket-holder.....C. L. Brush
Ticket-holder.....A. V. Sims
Ticket holder, Milk-.....J. H. Rackmyer
Tile, Roofing-.....B. L. Bacot
Time-controller, Electric.....H. K. Wood
Time cut-out.....J. Gardner
Tire, Automobile-.....F. E. Modlin
Tire, Automobile-.....J. Shaw
Tire, Pneumatic.....G. J. Paynter
Tire-retaining flanges, Securing device for.....R. S. Bryant
Tires, Device for inserting balls in.....J. S. Summers
Tobacco-curing stick.....J. G. Sharon
Toll-box.....J. M. Baker
Tool.....M. H. Stevens
Tool, Electrically-heated.....M. J. Wohl et al
Tool handle, Pneumatic-.....W. O. Duntley
Tool, Mortising-.....J. Anderson
Tool, Rock-drilling.....H. G. Williams
Toy.....T. Harris
Trains, Apparatus for automatically controlling the speed of.....J. G. Schreuder et al
Trolley.....S. B. Sickelsmith
Trolley-head and guard....J. G. McGuffey et al
Trolley stand or base, 2 pats....C. J. Geterman
Trousers stretcher and creaser.....U. C. Roumillat et al
Truck, Printer's form-.....J. A. Mashek
Truck provided with special ball-bearings.....C. Gentle
Tube-making machine.....M. E. Curtis
Tube-sections and similar parts, Machine for making.....A. H. Nilson et al
Tunnel-boring device.....R. H. Keays
Turbine-motor.....T. S. Patterson
Twyer-iron.....R. C. Kraatz
Type-case bracket.....A. T. Gaumer
Type, Machine for forming justified lines of..W. T. Hoofnagle
Type-writer.....E. J. Barker
Type-writer case.....B. S. Gore
Type-writer copy holder and marker.....T. W. McCreary
Type-writing machine.....H. P. Moorrees
Type-writing machine.....C. H. Shepard
Type-writing machine.....E. S. Morgan
Type-writing-machine tabulating device.....F. J. Tanner
Type-writing machines, Paper-feed for front-strike.....W. R. Fox
Umbrella, Folding.....R. Greenwood
Umbrella-frame.....J. Rose
Unit switch Multiple-.....H. W. Cheney
Valve.....N. B. Creighton
Valve.....E. W. and W. H. Roberts
Valve alarm attachment.....R. F. Spamer
Valve, Automatic engine stop-, 2 pats.....J. L. Kimball
Valve, Balanced slide-.....W. F. Gould
Valve cage for air-brake pumps, Air-.....J. Mattingly
Valve, Flush-.....D. W. McNeil
Valve, Flushing-.....D. W. McNeil
Valve, So-called reducing-.....C. E. Squires
Valve, Triple.....W. V. Turner
Valve, Triple.....W. V. Turner et al
Vault, Burial-.....W. C. Reinmiller et al
Vehicle attachment.....C. Todd
Vehicle controlling means, Motor-.....W. F. Richards
Vehicle fare-register.....R. G. Popp et al
Vehicle foot-rest.....A. E. Smith
Vehicle, Motor-.....S. R. Brainard
Vehicle-spring clip.....R. Jardine
Vehicle-wheel.....M. M. Bailey
Vehicle-wheel brake-shoe.....J. Earlam et al
Vehicle-wheel cushion-tire.....E. J. Duff
Vehicles, Connection with taximeters or fare-indicators for.....C. Mascart
Vehicles, Device for detaching horses from....T. M. Bovard
Vehicles, Device for indicating the intended movement of.....P. S. Douglas-Hamilton
Vending-machine.....J. E. Packard
Vending-machine, Coin-controlled.....G. W. Finney
Vessel, Hydroplane.....G. R. Clifford
Vessels, Quicksilver-closure for fermentation..W. Lazarus
Voucher-severing device.....A. H. Graves
Wagon and portable furnace, Hygienic.....D. Mandel
Wagon-body.....J. T. Smither
Wagon-body.....W. Graham et al
Wagon-reach.....H. Braum et al
Washbasin.....D. W. McNeil
Washing-machine power-transmitting device....T. J. Winans
Water-closet seat.....E. C. Stover
Water-gage, Electric-alarm.....C. C. Marsh
Water-meter.....A. H. and C. H. Kennedy
Water-softening apparatus, 2 pats..W. M. Bruce
Web material, Feeding.....C. B. Stilwell
Well or cistern top.....W. B. Libby
Wheat-heater.....H. F. Pietsch
Wheel.....R. W. Pringle
Wheel.....B. C. Seaton
Wheel, 2 pats.....T. J. Thorp
Wheels and shafts, Safety device for connecting.....W. F. Richards
Wind-shield.....J. H. Sprague
Winding-machine.....B. Hurd
Window, Bay.....L. G. Quackenboss
Window-lock.....W. E. De Voe
Window-lock.....C. H. Caler
Window-lock, Automatic.....A. N. Davis
Window-pane fastener.....H. G. Frazier
Window safety device.....J. Fishman
Window-screen.....F. F. Hultgreen
Window, Swinging.....H. J. Schlacks
Wire-fence clutch.....E. Shultz
Wire-stretcher.....B. Goodman
Wire-stretcher.....B. Hartness
Wire-stretching appliance.....G. L. Kroder
Wire structure.....T. G. Melish
Woodworking-machinery safety appliance.....F. Braun
Wrench.....R. Keil

DESIGNS.

Collar supporter, Neck-.....F. L. Leyser
Emblem.....B. Martin
Gas steam-radiator.....J. H. Mead
Inkstand.....C. H. Numan
Neck-ruff form.....T. P. Taylor
Niche or shrine.....J. Koenig
Purse.....F. L. Bradford
Stove.....J. C. Hosford
Trimming.....W. Helbig

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Acid, Converting catechin into a catechu-tannic.....W. Osborne et al.
Advertising device.....J. W. Phelps
Aerial vessel.....C. J. Lake
Air conduit, Hot-.....W. W. Hanold
Air, gas, &c., Device for drying..O. Touzimsky
Amusement apparatus.....M. R. C. Sonntag
Amusement device.....I. Kiralfy
Anchor.....T. Downie
Anchor, Ship's.....H. M. Hingley et al
Animal-marker.....I. O. Olsen
Ankle support and protector.....H. J. Collis
Antislipping device.....C. J. Marius
Armature-coils, Device for use in making.....J. F. Card
Assaying.....J. C. Hames
Attaching and releasing device...D. B. Russell
Automobile driving-mechanism support.....E. W. M. Bailey
Automobile rear-axle transmission mechanism..M. L. Williams
Automobile steering device.....J. Carter
Automobile-wheel.....E. S. Lea
Awning-operating device.....W. Nehring
Bag-holding appliance.....W. F. Twombly
Bail-ear.....F. Westerbeck
Basin and trap, Catch-.....J. R. Williams
Bath or basin waste.....H. M. Weaver
Bath-tub supply and waste.....D. C. Charmois
Batteries, Method and apparatus for revivifying dry-cell.....H. B. Ramey
Bearing, Antifriction-.....G. Matta
Beet-blocker.....C. Canutson
Belt-fastener.....P. A. Hudson
Belt, Fireman's.....J. E. Smith
Binder, Loose-leaf.....A. B. Underwood
Binder, Loose-leaf.....C. H. Mann
Blast apparatus.....E. L. Thompson
Block-signal system.....G. S. Pflasterer
Boat-propeller.....E. Daniel
Boiler-check-valve clean-out.....J. R. Martin
Boiler compound.....H. R. Young
Boiler installation.....E. N. J. Germeau et al
Boilers, Apparatus for producing circulation in steam.....V. Andrioli
Bolt-blank hreading and turning machine.....C. K. Lassiter
Bolt-extractor.....G. D. Morrison
Boring, turning, and facing machine.....E. B. Sellew
Bottle-capping machine.....B. Adrianee et al
Bottle-draining and box-cleaning device, Combined.....H. W. Noethig et al
Bowl, Flush-.....B. G. Butler
Bowl, Separator-.....G. Webster
Box.....R. A. Robbins
Box-cover press.....H. Vial
Box-lid holder.....T. F. Manley
Brass-polishing device.....C. E. Merrill
Breast-drill.....J. G. Smith et al
Bridle winker-strap.....T. J. Steen
Brush.....C. Petersen
Brush-making machine.....J. E. Snevely
Brush, Tooth-.....C. L. Alexander
Brush trimming and cleaning machine.....H. J. Lebherz
Bucket, Minnow-.....A. W. Hart
Bucket, Scoop-gaging.....G. L. Stuebner
Bucket, Wheelbarrow hoisting-.....A. Smith
Buckle.....N. Koster
Bull-rings, Manufacturing.....C. P. Showell
Bung.....W. H. Gerald
Buoy, Ring.....H. F. Buseh
Burglar-alarm.....C. G. Munsell
Burner-vaporizer.....C. Heinrichsdorff

Cable conveyer-hoist....B. C. Riblet
Cable-terminal....F. B. Cook
Calculating appliance....G. W. Evans-Cross
Camera, Foldable reflex-....E. Brauburger
Can-closing-machine blank-feed mechanism....O. Dempewolf
Can-soldering-machine soldering device....G. Smith
Can-stoppers, Implement for applying and removing....F. Westerbeck
Capsules with liquefied gas, Appliance for charging....P. Giron
Car-axle-box lid....H. C. Gamage
Car-bolster-reinforcing construction....F. L. Irwin
Car construction, Box-....F. L. Irwin et al
Car-coupling....J. Kelso
Car-coupling, 2 pats...W. McConway, Jr. et al
Car, Dump-, 2 pats....A. Campbell
Car-rack....W. B. McCarthy
Car-releasing device, Log-....E. Beaudin
Car-roof....J. Masker
Car wheel, Motor-....J. H. Symonds
Cars and other vehicles, Pedal-guard for motor-....A. J. Last
Carbid, Manufacture of silicon....F. J. Tone
Carbureter, 2 pats....W. Eckert
Carbureter....P. Bertrand et al
Carbureter for explosive-motors....G. W. Slaughter, Jr.
Card, Sample-....J. G. Cohen et al
Carline-reinforcing construction....F. L. Irwin
Carpet and linoleum stretcher....G. E. Nordgren et al
Carriage and cradle, Convertible....H. Wilchinsky
Carriage, Baby-....C. F. Thayer
Carriage-body....J. C. Moon
Carriage-body....S. A. Moore
Carriage, Collapsible or folding....R. Fleischmann
Carriage, Folding....A. J. Adams
Cash register and indicator....J. F. Parker
Cash register, indicator, and recorder, 2 pats..J. F. Parker
Cement-mixer....A. G. Olsen
Cereal food....M. C. Jackson
Cereal products, Reducing disk machine for the manufacture of....H. D. Perky
Chain, Drive-....W. M. Butler
Chair....J. J. Sherman, Jr.
Chair and stand, Combined drying....L. Schreiber
Chart, Tailor's cutting-....M. F. MaLoney
Check-marking apparatus..C. H. Marston et al
Chuck....E. S. Savage
Churn....W. J. Snow
Churn....F. W. Cooper
Circuit-controller....S. Holland
Circuit-controlling instrument....G. M. Willis
Clip-file....C. Spiro
Clothes-line holder....P. L. Schmidt
Clothes-line prop and tightener....O. R. Olson
Clothes-rack....A. D. Daniel
Clutch....P. A. Geary
Clutch....L. C. Freeman et al
Coal and other carbonaceous substances, Retort for the distillation of....T. Parker
Coal-tipple....J. S. Pates
Cock, Angle-....W. B. Heiniger et al
Coffee-mill....W. W. Dryden
Coin-controlled mechanism....J. C. Fredell
Coin-repository, 2 pats....B. von Eigen
Collar-supporter....J. W. Schloss
Combination table and lounge....T. McGaw
Composite pipe....J. T. Langford
Composition of matter....R. Rumbel
Concrete-block-molding mold....A. Evenstad
Concrete construction, Reinforced....E. F. Wilcox
Concrete or other plastic material, Apparatus for use in building structures of..D. Morgan
Concrete-wall-construction mold....G. Taubert
Concrete-work, Reinforcing-bar for....E. C. Woodward
Condiment-holder, 2 pats....J. W. Meaker
Conduit, Metal....W. M. Caswell
Cone shaper, Edible-....L. L. Westling
Cooking-utensil....R. M. Austin
Coop, Poultry-....H. W. Burgett
Core-making apparatus....J. R. Davies
Cork compound and making same....J. J. C. and M. Smith
Corn-husking apparatus....W. B. Havens
Corset, Apparel-....D. Kops
Cotton-chopper....T. H. Ellis
Cotton-chopper....J. W. Garrett
Cotton-chopper....D. H. Callahan
Cotton-chopper....S. T. Hogan et al
Counter-measure, Computing...F. I. Goodenow
Cow-milker....F. M. Devore
Crane-jibs, &c., which move in a vertical plane, Mechanism for raising....F. Heym et al
Crane, Traveling....W. H. Morgan
Cream-separator....W. C. Hartmann
Cream-whipper....J. M. Kier
Creasing-machine....J. F. Cleary
Crop-handling machine....J. B. Schuman
Cultivator....E. Biss
Current indicator, Electric-....F. N. Conant
Current apparatus, Undulating-...F. Cedergren
Curtain and shade holder, Window....A. Logsdon
Curtain-pole....F. Wukmanic
Cutlery....A. Grah
Cutter and shredder....J. J. Farquer
Cycle ammonia power or refrigerating apparatus, Continuous-....J. Robson
Cycle, &c., driving and braking mechanism....R. Walker
Cycle saddle, Motor-....F. Mesinger
Cycle-stand....H. T. Adams
Densimeter....A. Müntzing
Detachable coupling....F. G. Fairall
Detinning....H. M. Fernberger et al
Digging implement....J. R. Baylis
Distance-finder....J. G. R. Lilliendahl
Distributer....W. H. Sanders
Door....L. C. Dalhousie
Door closing and checking device..A. H. Sulser
Door, Fire-escape....J. B. Bernier
Door-hanger....J. W. McQueen
Door-hanger....G. Lane
Door hanger, Sliding-....W. W. Clark
Door hanger, Sliding-....A. Jenson
Door, &c., latch and lock....F. G. Marbach
Door-securer....W. Minderlein
Doors, gates, &c., Engaging mechanism for....F. G. Marbach
Dough mixing and kneading machine....G. J. Hicks
Drain-tile trimmer....A. Connor
Drier....F. A. Hetherington
Drilling and reaming device, Templet....W. Berger et al
Dust collecting and absorbing substance....J. A. Duffy
Dye, Red, 2 pats....W. König
Dyeing-machine....W. Erler
Dynamo and motor brush-spring....J. H. Poole
Electric broiler....G. E. Stevens
Electric controller or switch contact....A. White
Electric-cord retriever....W. O. Rew
Electric-installation tubes, Adjustable coupling for....W. H. Vibber
Electric machine, Dynamo-....B. G. Lamme
Electric machine, Dynamo-....L. Lyndon
Electric metal-working apparatus....A. E. Buchenberg
Electric-motor-control system....W. Cooper
Electric motor for high-tension currents....N. Myschkin
Electric time-switch....W. E. Richter
Electric trap....G. S. Riggs
Electrical and other fixture clamp....W. M. Meacham
Electrical apparatus....O. Schaumberg
Electrical-apparatus synchronizing means....A. C. Crehore
Electrical connection....G. H. Pride
Electrical fuse-spitter....J. B. Sauve et al
Electrical-receptacle door-hinge...W. W. Jones
Electromotor automatic starter, Continuous-current-....G. A. Schoeller et al
Elevator-door....A. J. Zitzmann
Engine and volatile-fluid-engine plant, Gas-....J. Robson
Engine carbureter, Hydrocarbon-....G. Breeze
Engine valve-operating mechanism, Explosive-..H. Steingassner
Engines, Means for cooling the cylinders of explosive-....D. B. Whitehill
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Envelop....J. C. Brown
Envelop for air-proof material..A. T. Saunders
Extensible bracket....O. H. Pieper
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Eyeglasses, Nose-guard for....J. H. Ostrander
Feed-box and manger, Combined....J. E. Thompson
Feed-mixer....J. S. Kilpatrick
Feeding mechanism....O. C. Hill
Fence, Portable baby-....R. H. Villard
Fence post and wire fastener....J. H. Knickerbocker
Fence-stretcher clamp, Woven-wire-....W. Hopper
Fence stretcher, Wire-....W. Hopper
Ferrule, Plumber's....J. R. Donnelly
File, Paper-....C. Spiro
Films, Device for repairing moving-pictures...C. R. Uebelmesser
Fire-alarm, Automatic....O. B. Johnson
Fire-escape....K. G. Feyma
Fire-protection-signal system..J. G. Nolen et al
Fireproof building construction....C. Collins. (Reissue.)
Fireproof covering....A. O. Brigance
Fireproof partition....W. Orr
Fish artificial bait....B. F. Burke
Fishing-hook, Gang....S. R. Sutton
Flaking-machine....E. M. Lawrence
Flicr....F. H. Martin
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Flue-cleaner....E. B. Barnhill
Fluid-cushioned bearing, 2 pats....A. Ponten
Foot or leg attachment for use in swimming..C. W. Hill
Form, Dress-....C. A. Ufford
Fruit-stoning machine....J. H. Smith
Frying device....J. Renner
Furnace....J. D. Reekie
Furnace....P. B. and L. J. Heckler
Furnace charging apparatus, Open-hearth-....B. W. Head
Furnace-regulator....F. D. Kees
Fuse, Impact-....A. Wratzke
Gage, Multiple....G. O. Hammer
Garbage-receptacle....P. W. Nicola
Gas-burner....J. Du Ross
Gas-burner baffle....J. Schirra
Gas-element electrode....E. W. Jungner
Gas-engine....J. E. Patterson
Gas-engine, Rotary-....J. E. Friend
Gas-producer....J. A. Waldburger
Gases into liquids,Apparatus for introducing..S. P. A. Wenström
Gaseous fluid under pressure, Device for delivering....C. A. Claflin
Gate....W. A. Ford
Gate....P. H. Wilson
Gate....W. P. Sowers
Gate....H. K. Tabler
Gate stop, Water-....G. E. Kellar
Gear, Reversing-....A. N. Woods
Gear, Transmission-....M. L. R. Howald et al
Gear, Variable-speed....G. J. Dallison
Gearing....R. Milne
Gearing....T. J. Winnans
Glass-blowing apparatus....A. J. Bates
Graphophone attachment....H. C. Kelly
Grate....J. S. Wood
Greenhouse construction....E. F. Kurowski
Grinding-machine....H. B. Nichols
Gun action-slide lock, Take-down-....F. D. Peltier
Gun, Barrel-recoil....N. Koch et al
Gun-turret alarm device....J. L. Hall
Hair-cutting device....A. Lancellotte
Hair-pin....L. P. Shaw
Hair-roll and comb, Combined....H. Feder
Harrow....F. Germon
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Harvester, 2 pats....C. M. McCormick
Hat-pin....J. C. Steele
Hat-pin, Ornamental safety....S. J. Jacobsen
Heater....E. B. Raymond
Heating and illuminating device....S. S. St. Hoor
Heating apparatus, Electric....F. Conrad
Heating device, Electric....C. Aalborg
Heating system, Hot-water...A. E. Crowhurst
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Hog-waterer, Automatic....C. Pelmulder
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Horse-feeding device....E. M. Rand
Hose-coupling....C. H. Chapman
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Hose-supporter....F. F. Knothe
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Insulator-mold....C. C. Johnson
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Iodin compounds of fats, Manufacture of new stable....B. R. Seifert
Iron, Extracting....C. G. P. de Laval
Iron or steel, Solution for treatment of....A. Hayes
Ironing-press....F. Krapp
Jack, wire-stretcher, and post-puller, Lifting-..L. T. and T. H. Goolsby
Jar-closure....J. L. Kivlan
Journal-box, Railway....E. G. Caughey
Journal-box waste-supporting attachment....R. A. Billingham
Jury and jury-frame for facilitating orthopedic treatment....G. W. Haas
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Lace-fastener....W. H. Schweitzer
Ladders, steps, trestles, &c., Adjustable foot for....G. Bartlett
Lamp, Arc-....C. A. B. Halvorson, Jr.
Lamp-burner....R. A. Sommerville
Lamp, Electric....I. Ladoff
Lamp, Electric-arc....W. R. Ridings
Lamp, Incandescent gas-....H. E. Woods
Lamp-socket keys, Cam for....G. B. Thomas
Last....A. G. Fitz
Lathe driving-center....B. Wehner
Lemon-slice-squeezing device....C. Doll
Lever mechanism....J. F. S. Goble
Line setting and casting machine...H. Degener
Linotype and other type-casting machine....C. A. Albrecht et al
Load lifting and releasing device..M. C. Myers
Lock....V. Bily
Lock-pin....V. V. Pittman
Locomotive-pilot....W. E. Justis et al
Loom filling-detecting mechanism...R. Burgess
Loom pick-finder mechanism..B. F. McGuinness
Loom selvage-motion....J. Belavance
Loom shuttle mechanism....P. Martourey
Lubricator....W. E. Parr
Mail-chute, 4 pats....L. Ehrlich
Mail-handling apparatus....D. E. Coughlin
Mail-holder....M. Cooper
Mail-pouch-handling apparatus...W. A. Loomis
Marker, Land-....H. N. Randall
Massage apparatus....M. A. Haines
Match-safe....M. B. Keller
Match-serving box....J. Hermann
Measuring-last tape....G. E. Belcher
Measuring roll, Non-recount fabric-....W. W. Birnstock
Mechanical movement....J. D. A. Johnson
Mechanic's case....W. F. Shrum
Medical apparatus for injecting purposes....K. Krautschneider
Metal bars by twisting, Machine for cutting...H. H. Jensen
Metals electrolytically, Precipitating....A. Ramén
Metallic structure....P. M. Wege
Metallurgical process....G. Moore
Milk-cooler....W. Mitcham
Milk, Pasteurizing....J. Willmann
Mine, Submarine....M. Klauber
Mine, Submarine....K. O. Leon
Mines, Removing loose materials, dust, and gases from....F. T. Byers. (Reissue.)
Mold....J. L. Sackett
Molding apparatus....S. Griffith
Molding-machine....J. T. Brent, Second
Mop and brush fabric making machine....L. Stocker
Motor starting device, Electric-...C. D. Knight
Motor-system control....E. Gruenfeldt
Motors, Operating alternating-current....R. D. Mershon
Mower, Lawn-....A. L. Le Vine
Needle....C. V. Reeder
Nitroglycerin, Manufacturing....F. Aigner
Nut, Lock-....C. H. Stall
Nut-lock....S. H. Coleman
Nut-lock, 2 pats....W. H. Cottrell
Nut-lock....C. H. Ferguson
Nut-lock....G. M. Holman
Oar-lock....C. Bestman
Office and store furniture, fixtures, &c., Fireproof covering for....L. Barg
Oil-can for oilstone-boxes....C. B. Cox
Oil-separator....A. E. Embree
Ordnance recoil-check....L. M. Fuller
Ore, cement, and general pulverizing mill....A. Tregoning
Ore-separator....A. S. Campbell
Ores, Smelting....J. T. Carrick
Orienting mechanism....C. H. Pope
Oven, Collapsible....W. E. Sloan
Oven screen and mat....A. McNulty
Package-binder....A. W. Miller et al
Package-fastener....W. M. Cleaveland
Packing, Shaft-....B. Ljungström
Paper-board-manufacturing apparatus, Multiply-....H. C. Herr
Paper can, Sanitary waste-....M. K. Miller
Paper-making machine....J. W. Packer
Paper-making-machine reel-belt tightener....J. W. Packer
Paranitranilin red, &c., Obtaining, 2 pats....E. A. Fourneaux
Paste-applying mechanism....H. C. Herr
Pasteurizing apparatus....A. A. Pindstofte
Percolator....J. R. Holley
Piano actuating mechanism, Autopneumatic-....R. H. Fischer
Piano automatic music-playing attachment....I. B. Smith
Piano, Automatic playing-....A. G. Gulbransen
Piano tune-sheet attachment, Automatic-....A. J. Hobart
Pianos, Means for preventing interference in assembling self-playing....E. C. Hiscock
Picture-hanger....F. Greene
Picture-machine reel, Moving-....C. R. Uebelmesser
Pipe-bending machine....C. Gordon
Pipe connection....B. D. Coppage
Pipe coupling and connection....M. N...
Pipe or hose coupling, Detachable-....G. Jan...
Pipe-threading machine....V. D. Arthur
Planter, Check-row-....B...
Planter, Corn-....H. N. Ro...
Planter marker attachment....A. F. B...
Plastic materials, Machine for forming articles of....H. Lippold et al
Plate and hot-dish lifter....J. A. K...
Plow soil-pulverizing attachment....L. M. Kra...
Poke....F. A. Kin...
Pole-sleeve....W. D. G...
Post and pole protecting-sleeve....C. G. Ett...
Post-brace....D. Hou...
Pot for making coffee, &c....A. P...
Power blower, Water-....J. L. Ware
Preserving-can, Vacuum....S. G. Wiffin
Pressure gage, Gas-....W. Thomas
Printing-machine sheet-delivery apparatus....G. P. Fenner
Printing-plate holder....W. Neasham
Printing-plates, Producing....B. Gisevius
Printing-press automatic throw-off mechanism..J. E. Tucker
Projecting apparatus....V. E. Mellre
Proof-roller, Self-inking....F. A. Bary
Pruning implement....E. N. Higley
Pump....J. J. Wernette
Pump, Bucket-....W. L. Deming
Pump, Centrifugal....S. A. Huntley
Pump, Double-acting deep-well....J. Gleason
Pump-governor....J. F. Senter
Purifying materials, Recovering....H. Hirzel
Puzzle....W. D. Taylor
Railway grass-line trimmer....C. Bartel
Railway, Pleasure-....J. S. Paul
Railway-road-bed-grading apparatus....H. B. Earling
Railway-signal safety-stop-signal attachment...J. M. Moore et al
Railway-tie....F. M. Weaver
Railway tie and chair combined....S. A. Ross
Razor, Safety-....J. M. Wallace
Razor, Safety-....F. H. Arnold
Refrigerator....A. Finch
Revolver-loader....M. J. Kellogg
Ringing-key....K. Weman
Rock-drill....L. H. Jenkins
Roll-holder....E. O. Bulman
Rotary engine....S. W. Black
Rotary engine....G. L. Webster
Rubber, Reclaiming devulcanized....E. E. A. G. Meyer
Rubber-ring-cutting machine....L. J. Pianarosa
Rug-clamp....J. B. Petrie et al
Safe, Provision-....H. Miller
Salt-shaker, 3 pats....J. W. Meaker
Sash-fastener....V. A. Kemper
Sash, &c., hinge, Stone-....J. G. Ralph
Sash-lock....J. Schweida et al
Sash-lock, Adjustable ventilating....N. S. Hillyard et al
Sash-lock, Gravity....F. Bogenberger
Sash-weight....C. M. Conklin
Saw, Crosscut-....E. J. Barnes
Saw-handle....F. L. Blomquist
Saw leveling and stretching machine....N. L. Botten
Sawing device....J. Weber
Sawmill-nigger....J. A. Gillard
Scale....G. W. Cope
Scale, Automatic weighing-...J. J. Linden et al
Screw-slotting machine....F. N. Tilton
Seam-dampening machine....T. Tothill, Sr.
Seats, Tufting-button for cushion-....L. A. Young
Sectional boiler....R. Glogner
Seed box....A. G. Yates
Sewers, &c., System for ventilating and purifying....E. F. Head
Sewing-machine....J. P. White
Shade-holding device....C. L. Hopkins
Shaft-detacher....C. Murphy
Shaft reversing mechanism, Rotating-....W. H. Brown
Shaft-work detachable hook....C. O. Vowell
Shaving-cup....J. Hasselbring
Shears....G. W. Thorsell
Shears tension device....C. W. Sprague
Sheep-shearing machine....W. Silver
Shock-absorber....J. Krejci
Shock-loader....E. Pitcher
Shoe-fastener....M. E. Jackson
Shoe-lace-holding device....W. F. Shults
Shoe or socket for loggers' falling-boards....A. McNulty
Sign....G. A. Marsh
Sign, Electric....B. E. Salisbury
Signaling system....R. H. Marriott
Skirt-marker....M. Ryan
Skylight and ventilator, Combination....M. W. Pehl
Sled....J. D. Bohanan
Sleigh, Bob-....R. Pintsch
Sole, Shoe-....R. C. Ross
Sound-box....G. Osten
Sound-vibrations, Means for signaling or effecting operations by means of....J. Gardner
Spark-plug....H. F. Parker
Spark-plug....C. Bateholts
Spark-plug....F. H. Weinhauer
Spindle appurtenance....I. E. Palmer
Spinning and twisting machine, Rotary ring....C. T. Atherton
Spinning, apparatus, Yarn-....A. E. Rhoades
Spooling or winding machine attachment....G. A. Metcalf
Stairway, Fireproof....F. A. Winslow
Stand....S. S. Eccleston
Staple-driver....K. G. Kafer
Station-indicator....T. R. Clark
Steam-engine....J. F. Chuse
Steam-generator....T. C. Aldrich
Steam-generator....F. N. Tilton
Steam-superheater....E. H. Foster
Steam-trap....G. M. Hilger
Steam-trap....J. J. and J. W. Kelly
Steam utilizing system, Exhaust-...Y. Wadagaki
Stove....A. McNulty
Stove antirust compound....C. F. Green
Stove damper, Gas and gasolene...G. E. Davis
Stove-grate....J. Jefferson
Stove-hood....A. Brouillet
Stove, Vapor-....G. E. Savage et al
Strapping-machine....W. M. Kidney
Street-sweeper....F. A. Bishop

Strip-serving apparatus.....E. L. Brownson
Surveyor's target.....G. T. Stephenson
Swing, Scoot-.....E. K. Hood
Switch.....B. F. Nickerson
Switch and stand for pressing-irons, Automatic.....F. E. Emery
Switch and stand for pressing-irons, Automatic electromagnetic.....F. E. Emery
Switch mechanism and actuating means therefor.....J. C. Phillips
Switch-stand.....C. W. Reinoehl et al
Switch-stand.....F. C. Anderson
Swivel.....H. M. Rounds
Table lock, Pedestal-extension-...W. Dickinson
Tapping-die.....G. Ermold
Target.....H. M. Stern
Tea-strainer.....C. S. Rollins
Telegraph transmitting-machine.....J. C. J. Alderson
Telephone call mechanism.....W. E. Zabst
Telephone-exchang details, Call-distributing...S. H. Browne
Telephone-exchange system.....G. Babcock
Telephony, Multiplex.....M. C. A. Latour
Tellurian.....L. H. Van Syckle
Temperature-annunciator.....N. D. Wyman
Threshing-machine level attachment.....A. Ferguson
Throw-out mechanism.....A. J. Ford
Ticket, Transportation-.....E. A. Denham
Tie and rail-fastener.....M. H. Eells et al
Tilting gate.....E. Sample
Tire.....T. Midgley
Tire detachable securing means, 4 pats.....J. Baker
Tire grip-tread, Pneumatic-....W. P. Shattuck
Tire repairer, Rubber-.....J. M. Padgett
Tire, Vehicle-.....W. A. Koneman
Tongs, Clinker-.....W. W. Church
Tool, Combination-.....B. F. Bird
Tool-handle.....G. E. Wood
Tool, Percussively-operated hand-..G. E. Wood
Tool, Smoothing-.....C. R. Uebelmesser
Tooth, Artificial.....M. F. Henle
Torch burner, Blow-.....E. Beyer
Toy.....P. S. Hay
Trace-carrier.....S. Wold
Traction-wheel.....D. L. Brownfield
Transmission and chain-adjustment mechanism, Combined.....J. M. Michaelson
Trap.....G. O. Miller
Tree or staff holder.....C. Dreibuss
Trolley-pole wheel, Street-car.....S. Bryan
Trolley-retriever.....T. R. Gabel et al
Trolley, Roller-bearing.....W. H. Shaesby
Trolley safety device.....H. Nannenhorn
Trolley-wire connection.....G. S. Pannebaker
Trolley-wire hanger, Insulating..L. W. Moran
Trolley-wire turnbuckle.....H. S. Ollson
Truck-frame, Reinforced.....L. G. Woods
Truck, Lateral-motion car-....E. C. Washburn
Truck, Locomotive-tender.....W. L. Austin
Truck, Railway-.....S. E. Hitt
Truck wheel-fender, Car-...H. W. Bodendieck
Truing-gage.....C. W. Waldrip et al
Tube-drying apparatus.....J. R. Harbeck
Tumbler-lock.....L. F. Dahl
Turbine-blade.....P. Emden
Turbine-governing apparatus, Steam-.....H. F. Fullagar
Turn-table.....S. M. Hunter et al
Type-bar and bearing therefor, 2 pats.....A. W. Chamberlin
Type-casting machine..P. G. Nuernberger et al
Type setting and distributing machine.....E. Mirus
Type-writer stop device.....E. B. Cram
Type-writing machine, 2 pats..C. S. Nickerson
Type-writing machine.....W. J. Barron
Type-writing machine.....M. Klaczko
Type-writing machine.....F. C. Ursbruck
Typographic-machine key mechanism, 2 pats...F. H. Richards
Umbrella-holder lock.....J. C. Backus
Vacuum-gage, Mercury.....A. P. Hohmann
Valve.....M. R. Greenlee
Valve.....C. H. Foster
Valve, Automatic tank-.....W. H. Parton
Valve, Blow-off.....H. Kieren
Valve control.....L. A. Frayer
Valve, Flushing-.....G. A. Brown
Valve for grain-separators.....C. J. H. Grant
Valve for paper-pulp conduits...G. W. Kimball
Valve for water-closets, Supply...A. C. Einstein
Valve, Mixing and regulating.....C. J. Lake
Valve, Motorman's.....W. H. Terwilliger
Valve, Stop-.....F. Cachin
Valve, Tide-.....J. A. Morrison
Valves, &c., Machine for facing..T. B. Williams
Vault, Burial-.....P. F. Dehr
Vegetable-grater.....H. Arnstein
Vehicle attachment.....C. A. Zachow
Vehicle-axle spindle.....L. Burg
Vehicle cushioning device...A. Carpenter et al
Vehicle electrical-control system, Motor-.....E. Gruenfeldt
Vehicle safety-strap and bracket, Motor-.....R. Huff
Vehicle-shaft holder, Automatic.....A. Wetzel
Vehicle shock-absorber.....C. M. Kentzinger
Vehicle-spring.....A. Carpenter et al
Vehicle-spring.....R. Mulholland
Vehicle-starter.....O. David
Vehicle steering mechanism, Motor-.....E. R. Halsey
Vehicle suspension.....E. Batault et al
Vehicle-wheel.....T. Midgley
Vending apparatus.....N. J. Matthews
Vending apparatus.....E. W. Lindgren
Vending-machine.....N. N. Neher
Ventilator.....A. B. Stutz et al
Ventilator.....M. Ashcroft
Vessel, Double-walled.....A. Aschenbrenner
Vessel, Fluid-propelled.....C. J. Lake
Wagon-box.....W. F. Rodebaugh
Wagon-brake, Automatic.....J. C. Dunham
Wagon-brake, Automatic.....W. E. Woods
Wagon, Dump-.....W. H. Hill et al
Wagon hoister and dumper.....S. M. Smart
Wall mold, Concrete-.....L. Barg
Warp-twisting-in machine.....G. Hiller
Washbowl, Sanitary.....C. F. Tollzien
Washing device.....A. B. Moon
Washing-machine.....T. C. Josselyn
Water-filter.....C. L. Gardiner
Water-heater.....B. Gerdelman
Water into the cylinders of compressor, Means for injecting.....A. E. Jones
Water purification and clarification.....W. McMurtrie
Wave-motor.....C. A. Burrows
Wave-motor.....J. J. Pompa
Wax-gathering device, Rod-.....D. L. Heeter
Weed-puller and tree-trimmer....A. N. Moline
Wheel.....J. Soss
Wheel-scraper.....C. W. Stark
Wheel shield, Trolley-.....A. A. Roth
Winding-machine, Multiple..W. E. Wright et al
Window, Fireproof.....R. E. Byrne
Window-fixture.....N. M. Haney
Wing-sweep.....H. P. Jordan
Wire-lock.....N. C. L. Pedersen et al
Wire-reel.....A. H. Doyle
Wire-tightener.....W. E. Waller
Wood, Apparatus for impregnation of.....B. F. Watkins
Wood, Coloring.....W. A. Hall
Wrapping-machine web-cutting attachment.....J. H. Brady
Wrench.....D. G. Connell
Wrench.....E. Ohlsson
Wrench.....M. G. Albanaki
Wrench.....J. S. George

DESIGNS.

Badge.....F. Hughes
Bottle.....R. B. Annis
Chair.....L. Killian
Crumb-scraper.....A. N. Lattin
Electrolier, Street-.....R. Chartrey
Forks, spoons, and similar articles, Handle for.....T. B. Lashar
Spoon, fork, or similar article.....H. Hillbom
Spoon, fork, or similar article....H. L. Wallace
Spoon, fork, or similar article.....S. Stohr
Spoons, forks, or similar articles, Handle for..J. H. Harmstone
Talking-machine cabinet.....J. C. English
Trimming.....W. Helbig

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Account-keeping means.....A. L. Grayson
Acid, Officinal preparation of phosphoric.....J. Nicolaidi
Acids, Manufacture of homologues of para-aminophenylarsinic.....L. Benda
Adding-machine.....J. G. Vincent
Adding-machine carriage mechanism.....O. C. Kreis, Jr.
Adjustable bracket.....N. L. Holcomb
Advertising device.....H. P. Turner
Advertising-plates, &c., Device for moving....J. Albig
Air-brake system.....A. I. Perry
Aluminum compounds, Manufacturing.....E. L. Rinman
Amalgamator.....L. C. Laurent
Animal-hopple.....H. J. Meeks et al
Animal-trap.....S. A. Wilson
Arch supporter, Instep-.....E. H. Dunbar
Automobile-clock fastening device.....D. J. Hurley
Autovehicle mixed drive.....H. Pieper
Axes and eye-tools, Making.....C. P. Byrnes
Bag-holder.....G. L. Lyon
Baggage-roller.....R. F. Slater
Bail-attaching means.....F. J. Englen
Baking-pan, &c.....O. W. Bruner
Baking-powder, Manufacturing.....R. Paul
Baling-machine.....C. E. McLin et al
Baling-press.....J. P. Gomes
Baling-press.....J. C. Damron
Balling-machine.....A. E. Rhoades
Barber's register.....W. W. Gass
Basket-handle.....E. G. Hannon
Baskets, Machine for making fruit-.....J. E. Lynam
Battery-contact.....J. H. Gugler
Bearing for centrifugal separators.....T. S. Patterson
Bearing, Thrust-.....G. Rennerfelt
Beating and kneading machine.....R. F. C. Rambeaud
Bed-bottom, Spring.....J. W. Crowell
Bed-pan, Sanitary.....M. B. Morgan
Bed-plate.....F. J. Fleischhauer
Bedclothes-fastener.....E. L. Kelley
Beeswax-extractor.....O. L. Herhiser
Bell support, Smoke-.....H. C. Hepler
Bellows-chest.....P. B. Klugh
Belt, Conveyer-.....T. Robins
Belt,shifter.....E. Hinders et al
Benzene or its homologues from petroleum, Producing.....E. A. Starke
Bicycle-frame.....A. Lovedahl
Billiard-chalk holder.....F. Feldmann
Binder, Loose-leaf.....R. B. Wilson
Binder, Loose-leaf.....C. R. Nelson
Binders, Means for securing pages of loose-leaf.....J. S. McComb
Binding-post.....C. Barbour
Blade-sharpening machine.....R. S. Green
Blasting charges, Machines for fixing.....O. F. Malcolm
Blowing-can.....A. Eckhardt
Boat.....I. Anderson
Bogie with one or several axles..C. de Bange
Boiler.....W. A. Berry
Boiler-flue cleaner.....S. H. Limbert
Boiler-furnace, Sectional.....C. Phelps
Bolt, anchorage.....F. R. W. Cleverdon et al
Bookbinder.....F. G. Kollenberg
Bottle and jar closure.....L. Eschner
Bottle-crate.....W. C. Seifert
Bottle-making machine.....A. Watts
Bottle-necks and ground-glass stoppers therefor, Making interchangeable ground-glass.....C. M. Conradson
Bottle-necks and stoppers therefor, Machine for spirally grinding interchangeable spirally-.....C. M. Conradson
Bottle, Non-refillable.....D. J. O'Neil
Bottle, Non-refillable.....M. Forst
Box-blank-making machine, Wire-bound.....R. G. Inwood
Box lid, Journal-.....W. G. Dunham
Box-making machine.....E. W. Myers
Box-making-machine, Wire-bound-.....R. G. Inwood et al
Brake.....R. R. Stein
Braking mechanism.....P. N. Jones
Branding-machine.....W. J. Green
Brick-spreader pallet and truck therefor.....W. Friberg
Broiler.....B. McCaughey
Brooder.....J. F. and W. D. Craig
Brooder-heater.....J. C. Nicholls
Buckle.....L. Eckert
Buggy-top attachment.....P. Y. Fullerton
Bundle-wiring machine.....J. Pfeffer
Bundle-wiring pincers.....J. Pfeffer
Burglar-alarm, Electric.....A. Bloch
Burner.....E. De Loe
Burner.....A. F. Bauer
Burner-controller, Automatic....J. W. Dearing
Butter manufacture.....E. Schou
Cabinet.....J. W. Shauer
Cabinet, Credit-.....F. J. Peterson
Cable-tramway grip mechanism..R. D. Seymour
Can-making-machine feeding mechanism.....W. F. Hebrank
Can-opener.....E. W. Bishop
Can-stamping machine.....C. C. Brown
Car-bolster.....H. Pries
Car-brake attachment.....G. Frowen
Car, Convertible, 2 pats.....E. C. Harllee
Car, Dump-.....F. Hudson
Car, Dump-.....A. Campbell
Car, Dumping-.....A. Becker
Car grain-door, Freight-.....E. Posson
Car-heater.....E. J. Rauch
Car loading apparatus, Box-.....F. D. Buffum
Car, Poultry.....H. W. Burgett
Car, Railway motor-, 2 pats.....W. S. Hovey
Car-replacing frog.....L. Pluard
Car-standard, Trip.....W. Strathy
Car steering and governing mechanism, Motor-.....D. H. Coles
Car-wheel removable tire.....T. G. Aultman
Carbid of calcium, Preparing.....X. Hermé
Carbureter.....J. A. Steward
Carriage, Baby-.....A. J. Adams
Carriage hood attachment, Child's..D. R. Collier
Cash, parcels, &c., Apparatus for transferring..E. C. Phillips
Cash-registering till.....M. W. Smith
Catamenial receptacle.....P. J. Scheller et al
Catching and killing device.....A. Tebbit
Cattle-stanchion.....R. Grafton
Ceiling construction.....P. Allinio
Cell, Galvanic.....B. Jonas
Cement-applying machine.W. F. Lautenschlager
Cement, Making.....E. J. Winslow
Chandelier-hook.....C. M. Pitel
Charging the retorts of zinc and other analogous furnaces.....E. Dor-Delattre
Chime-whistle.....J. Donath
Chimney attachment.....C. Galitz
Chlorin, Apparatus for utilizing.....J. W. Aylsworth
Chlorinated compound and making same.....J. W. Aylsworth
Churn.....L. C. Lewis
Churn.....L. A. Smith
Churn.....C. S. McCalman
Churn.....R. E. Sharp
Cigar-machine.....R. Annigoni
Cigar-rolling table.....R. Annigoni
Clamp.....F. B. Cook
Clasp.....F. W. Seidl
Clip-binder.....P. Cohen
Clock, Advertising-.....J. B. Barnett
Clod-crusher and harrow, Combined.....W. W. Reichman
Clothes-drier.....F. T. Johnson
Clothes-line support.....J. Jacobs
Clutch, Friction-.....A. Charvin
Coal and the waste materials thereof, Apparatus for briqueting fine.....G. B. Damon
Coal and the waste materials thereof, Briqueting.....G. B. Damon
Cock, Automatic cylinder-.....C. E. Miser
Cock or valve.....W. H. Wakfer
Coffee-urn.....O. A. Nenninger
Colander.....O. E. Bohannon
Concrete-block machine.....E. P. Auger
Concrete floor construction, Fireproof.....J. D. Harrison
Concrete-mixer, Portable.....B. G. Leake
Conduit service-box.....J. Riddell et al
Cone burner, Glass-.....A. L. Edwards
Connecting-pin.....W. Fulton
Container-coating apparatus.....F. J. Macnish
Controlling device.....F. D. Howe
Conveying apparatus.....J. H. Gilman
Cooking utensil.....T. P. Aitkin
Cord connector and rack.....W. E. Hill
Cord for use in cord fabrics, Compound.....T. Sloper
Core for making cement conductors, Expansible and contractible.....M. Engeln
Corn-thinner.....C. B. Rhoades
Corset.....F. O. Ginnever
Corset.....R. B. Scognamillo
Cot, Child's.....M. M. S. Binney
Cotton-chopper.....R. R. Hyland
Cotton-chopper.....L. and J. P. Dewald
Coupling.....E. E. Gold
Cover.....F. Richardson
Crate, Poultry-.....D. Turner
Crib, Folding.....C. Ross
Cuff-holder.....P. C. Ottinger
Cultivator.....A. Barkley
Cultivator attachment.....D. B. Browning
Culvert.....D. C. Boyd
Culvert.....H. A. Brownell
Current regulator, Alternating-..R. S. McLeod
Design-making device.....A. L. Tolman et al
Detachable handle.....C. B. Post
Digester.....T. J. Hutchinson
Dipper-handle socket.....G. W. Knapp
Discount-machine.....C. A. Longwell
Door air-controlled lock, Sliding-.W. J. Martin
Door and other closures, Safety locking device for.....H. Rowntree
Door-check.....C. P. Dorn
Door-key.....I. E. Solomon
Door-lock guard.....L. Andersen et al
Door-locking device.....W. W. Cornman
Door mechanism.....F. S. Gallagher
Door-operating device.....J. T. Naulty
Door or other device pneumatic operating mechanism.....H. Rowntree
Door-securer.....P. A. Thorin
Door-stop.....J. M. Patterson
Door stop and fastener, Sliding-....G. Homan
Door stop and retainer.....S. L. Mefford
Draft-rigging.....C. A. Tower
Draft-rigging.....J. F. O'Connor
Draft-rigging, Friction.....J. F. O'Connor
Drill-chuck.....B. B. Farnham
Drill, Ratchet-.....P. Armstrong
Drill, Rock-.....J. A. Traylor
Drill, Rock-, 2 pats.....T. E. Adams
Drum, Toy.....E. Wolff
Drying finely-divided material, Apparatus for,.....R. S. Kent
Drying-machine.....J. H. Ryan et al
Dumping-device, End-.....L. P. Yale et al
Dye and making same, Azo...C. Immerheiser
Dye and making same, Azo...P. Julius et al
Eaves-trough.....A. Allen
Electric alarm, 2 pats.....T. Norpoth
Electric battery.....L. P. Basset
Electric-circuit controller, 3 pats.....H. W. Leonard
Electric-conductor supports, Guard for the arms of.....G. E. Harrison et al
Electric-current generator.....C. C. Ruprecht
Electric cut-out.....T. E. Murray
Electric fixtures, Wall-plate for.....I. Bond
Electric furnace.....P. L. T. Héroult
Electric-machine rotary members, Cooling device for.....J. Hissink
Electric power for traction purposes, System for the distribution of.....R. A. Weagant
Electric switch.....E. M. Carr
Electric traction on the surface-contact system.....D. Suchostauer
Electrical-apparatus swivel....A. A. Low et al
Electrical circuits, System of controlling the strength of direct currents in..M. M. Osnos
Electrical controlling device....J. T. Whalen
Electrical measuring instrument.J. F. Begole
Electrical switch.....T. Clark et al
Electrolytic process of producing compounds..C. E. Acker
Electrolytic process of produeing nitrogen compounds.....C. E. Acker
Electroplating apparatus.....G. L. Meaker
Elevator-cage, Safety.....C. H. Sturgis
Engine-aliner.....J. O. Gibbons
Engine cooling device, Explosive-...G. Braun
Engine harvester attachment, Traction-.....J. M. Will
Engine-starter.....F. A. Rogers
Engine wheel, Traction-.....E. L. Van Dolsen
Envelop.....L. W. Simmons
Envelop.....E. Heyer
Envelop.....G. Davis
Envelop, Return-.....T. J. Sales
Envelop-sealing and stamp-affixing machine...S. C. Kindig et al
Excavator.....W. Hurst
Exercising apparatus.....A. Zünd-Burguet
Expansion-bolt.....D. R. Berry
Eye-cup.....C. A. Maher
Eye-guard.....H. S. Cover. (Reissue.)
Eyelet-stay-joining machine...F. L. Anderson
Fare-collecting apparatus.....J. H. Coleman
Fare-register.....J. F. Ohmer
Feed and litter carrier.....H. J. Ferris
Feed-bag.....A. R. Hoffmann
Feed-rack.....J. F. Withrow
Feeding mechanism.....F. Waite
Fence-making tool.....W. S. Guinter
Fence-post.....W. H. McWhirter
Fertilizers, Manufacture of.....D. Shields
Fiber and making same, Fireproof.....K. P. McElroy et al
Fire-extinguishing liquid, Frostproof.....M. Breslauer
Fire-pot.....C. F. Coda
Fireproof material.....J. W. Aylsworth
Fitting-table, Dressmaker's.....V. H. Canham
Flanging-machine.....C. L. Finch
Flakes, Making thin metallic...T. A. Edison
Flat-iron heater.....J. Hagen
Floor-cleaner.....G. W. Ansley
Floor-polisher.....J. F. Weber
Floor scraper or planer.....J. F. Weber
Floor-surfacing machine.....W. A. Tash
Fluc-cutter.....H. H. Thornton
Fluid-pressure ram.....A. Parfitt
Fluid substances, Apparatus for desiccating...W. S. Osborne
Flush-meter.....A. Simons
Flusing-tank.....W. F. Adams
Fodder-shredder.....E. F. Gibbons
Foldingbox.....M. Hutchinson
Fork, Olive and pickle.....E. F. Menkin
Fruit-picker.....H. Tidd
Fuel, Artificial.....A. H. Ege
Furnace.....L. P. Cohen
Furnace.....R. A. Bailey et al
Furnace.....R. H. Sayre
Furnace feed mechanism.....W. C. Robinson
Furnaces, Operating electric..P. L. T. Héroult
Fuse-block, Automatic.....C. O. Prowse
Fuse-box, Electric.....T. E. Murray
Fuse, Safety-.....G. W. Hart et al
Galvanic battery.....B. Jonas
Gang-saw-mill carriage and steam-feed pressure-roll structure.....W. L. Miles
Garment, Bifurcated.....F. F. Lewis
Garment-hanger and clothes-tree, &e.....J. M. Hansen
Garment safety secret pocket.....I. Mensch
Garment-supporter.....W. P. Kellogg
Garter, Gentleman's.....G. J. Hall
Gas-burner.....H. A. B. Helander
Gas-burner.....E. Schumacher
Gas-engine.....C. M. Leech
Gas-engine.....J. G. Willet
Gas-generator.....J. A. Kenworthy
Gas-heater for water-backs....E. M. Kennard
Gas-meter pipe connection.....A. Ehebald
Gate.....J. Flinner
Gear for hoisting-machines and analogous uses, Reverse-.....A. Lambert
Gear, Sectional.....K. E. Porter
Gearing for hoisting-drums, Duplex.A. Lambert
Glass-drawing apparatus.....J. W. Cruikshank
Glass for open-top gas-meters, Proving-.....W. T. Drew
Gold-concentrating apparatus.J. H. Montgomery
Governor for air-compressors.....E. B. Coup
Grain-feeder and band-cutter.....A. A. Coburn et al
Grinding apparatus bearing.....E. Rivett
Gunpowder.....C. P. H. Claessen
Gun, Drop-down breech-loading...L. B. Taylor
Hair frame, pad or roll for ladies' use.....W. Schaffer
Hammock, Metallic.....I. Meyer
Hanger.....J. Bergquist
Harrow-tooth fastening.....H. M. Hughes
Harvester, Root-crop.....J. M. Bourland
Hat-cover, Lady's.....W. S. Turney
Hay-press.....C. L. Bowen

Hay-rake....C. Pearson
Hay-stacking apparatus....J. Pate
Headlight....R. H. Welles
Heat-regulator....R. R. Root
Heating apparatus, Water-..F. E. Lyon et al
Honey-extractor....J. F. Kropp
Hoof-pad....O. G. Woolverton
Hopple....W. S. Farrow
Horn, &c., Reaming and clamping device for....J. B. Hall
Horse-bit....F. M. Amobry
Horseshoe....P. J. Brislin
Hose connection for steam thaw-points....J. R. Mathews
Hose-making machine....C. R. Backmann
Hose-protector....H. F. Marendaz
Hose-supporter....C. J. White
Incubator....G. B. Hayner
Incubator....H. Brown
Internal-combustion engine, Rotary.G. Huscher
Ions, Ionizer or apparatus for producing gaseous....L. I. Blake
Jar-opener....M. C. Dearing
Jewelry, Safety-catch for stick-pins and similar articles of....W. I. Macomber
Jointer feeding device....H. B. Ross et al
Journal-box....G. A. Woodman
Kettle, Steam-....E. Kemp
Key-fastener....C. B. Keith
Kitchen-reminder....O. Roed
Kitchen-sink cover....A. G. Demarest
Knife and fork, Combined table...C. H. Ruble
Lamp....L. Schepmoes
Lamp....J. D. Landers et al
Lamp....H. N. Fowler
Lamp-burner....C. Stanek
Lamp-burner chimney-holder....T. M. Griffin
Lamp filament, Electric-glow-....H. Kuzel
Lamp-guard....W. T. Russell
Lamp, Kereosene incandescent...J. A. Mathes
Lamp light-regulator, Electric-..T. E. Murray
Lamp, Vapor-....A. A. Warner
Lantern....G. H. Rolfes
Last, 2 pats....E. J. Bliss et al
Lawn-sprinkler....D. W. Wells
Lawn-trimmer....J. Weber
Lead seals, &c., Machine for casting....N. S. Friderichsen
Lens-mounting....G. Lowenstein
Lenses, Forming....W. I. Seymour
Letter-carrier's storm-garment.W. H. Carpenter
Level, square, and tape-measure, Combination....R. L. Darter
Lever....G. W. Curtis
Light, Drop-....C. M. Pitel
Lining for mouthpieces for voice-transmitting instruments, Germicide....A. A. Williams
Liquid-surface drain for gas-holders....W. C. Morris
Liquids from mixtures of gases and liquids, Apparatus for separating....A. H. Barker
Lock....J. W. Bodge
Locomotive automatically-adjustable headlight....W. M. Cooper
Loom picker-stick check....T. Nevin
Loom shedding mechanism....H. Bardsley
Loom shuttle-operating mechanism, Narrow-ware....E. R. Holmes
Loom take-up mechanism....P. Day
Loom take-up mechanism....T. Nevin
Loom take-up mechanism, 2 pats....A. E. Rhoades
Loom take-up mechanism....J. O'Sullivan
Loom thread-parting mechanism.A. E. Rhoades
Mail-bag catcher and deliverer...E. Stiedinger
Mail-bag delivering and receiving apparatus....O. Gunther
Mail-bag-delivery apparatus for cars....L. J. Evans
Mail receiver and deliverer for railway-trains....A. Matlak
Mail receiving and delivering device, Automatic train and station....A. McArthur
Mangle....H. A. Hecker
Mantle-box....J. H. Russell
Marble slabs, Dividing....J. R. Pierce
Marker and gage, Combined siding....G. D. Baightel
Marker, Automatic....L. Biberman et al
Match....G. Galy
Match-box....E. Ellis
Match-box....A. Waag
Match-safe....H. K. and O. K. Porter
Meat-cutting machine....W. G. Doty
Mechanical movement....I. C. Rust
Metals in solution, Separating, 2 pats....H. H. Dow et al
Meter connection....A. L. Holmes
Milk-strainer....R. P. Ekstrom
Miter-box....N. J. Shimmel
Mixing apparatus....M. C. Peters
Moccasin....S. Armstrong
Mouthpiece antiseptic lining....G. M. Scroggs
Mowing-machine....F. Fisher
Musical instrument....P. Wuest, Jr.
Nitrogen from air, Obtaining...O. P. Hurford
Nut-lock....D. M. Kenyon
Nut-lock....R. B. Frisbee
Nut-lock....C. P. Dyer
Nut-lock....J. Schirra
Nut-shelling machine....C. S. Stevens
Obstetrical apparatus....B. H. Simpson
Oil from cotton-seed or other oleaginous material, Extracting....J. E. Mills
Oily materials, Method and apparatus for atomizing and spraying....H. O. Brandt
Ordnance sighting apparatus....A. T. Dawson et al
Ore-treating apparatus...F. E. Woodbury et al
Ores, Extracting precious metals from.I. Kitsee
Organic bodies, Chlorinating....C. Ellis et al
Oven, Baker's....J. Middleby
Oven, drying and baking....J. Wyman
Overalls....S. A. Melasky
Package elastic grip-band....W. Liddy
Paddle-wheel, Submerged feathering....L. Vojácek
Paper box....H. Syner
Paper-hanging machine....W. P. Evans
Pasteurizing apparatus....J. T. H. Paul
Peas on the vine, Roll for hulling green....E. G. Albaugh
Penholder, Ejecting....A. W. Alberry
Phonograph-horn....A. T. E. Wangemann
Photographic and printing purposes, Optical screen for....J. H. Smith
Photometer....F. E. Ives
Piano....P. Duffy
Piano, Sostenuto....P. Soblik
Piano mechanism, Self-playing-....A. F. Larson et al
Piano-sounding board press....E. C. Moses
Pin fastening, Connecting rod-....C. E. Van Auken
Pin setter and spotter for bowling-alleys....J. F. Wuerth
Pipe and beam clamp, Combined....M. C. Rosenfeld
Pipe coupling, Train-....W. F. Clasen
Pipe-making press....J. Fraser et al
Planer feed-roll....B. D. Stevens
Planter-sack, Self-feeder....A. C. Simmonis
Plants, Implement for hoeing and topping growing....A. P. Granger
Plaster-board....H. Shamiah et al
Plowshare, Boltless....M. Hagerup
Position-indicator....J. F. Hodges
Pressure-controlling device, Hydraulic-, 2 pats....J. W. Nelson
Pressure generating and applying device, Variable-hydraulic-....J. W. Nelson
Pressure generating and controlling device, Hydraulic-....J. W. Nelson
Pressure generating, controlling, and applying apparatus, Hydraulic-....J. W. Nelson
Pressure-generating-controlling device, Hydraulic-....J. W. Nelson
Printer's-chase....C. T. De Brisay
Printing-plate holder....W. J. Knoll
Printing-press attachment....W. E. Schwalm
Printing-press attachment....A. P. Harland
Propeller....F. J. Gowing
Pump and pressure controlling device, Hydraulic....J. W. Nelson
Pump, Dispensing-....C. F. Pressler
Pump, Dredger-....F. H. Jackson
Pump, Motor-....H. M. Cramer
Pump pressure-controlling device, Hydraulic-....J. W. Nelson
Pump pressure-controlling means, Hydraulic-....J. W. Nelson
Pump, Steam-....B. O. Gage
Punch, Center-....G. M. Ainsworth
Puzzle or toy....H. D. Bullard
Rack attachment, Hay-....A. L. Carlson
Rack bracket, Hay-....A. L. Lucas
Rail anticreeping device....G. W. Whiteman
Rail-joint....E. Fields
Rail-joint....E. Fixter
Rail-joint....C. G. Weygandt
Rail-joint....E. Fraser
Railway-crossing, 2 pats....E. W. Dwight
Railway-crossing....W. H. Meyerlambers
Railway or track for purposes of amusement....H. H. Martyne
Railway-rail joint....M. J. O'Connor
Railway tamping-machine...J. E. Farrell et al
Railway-tie, Metal....J. R. Robinson et al
Railway-tie, Metallic....L. C. Sharp
Railway-tie plate, 2 pats....W. S. Weston
Rake....G. E. Sutphen
Range....J. R. Supper
Razor safety attachment....H. D. Budde et al
Razor-strop....M. Krischer
Receptacle closure or retainer....L. Eschner
Recording-machine....B. Dysart
Regulator....G. W. Collin
Resilient wheel....R. Gaignard
Respirator....W. Bucklen, Jr.
Revolver....W. B. McCarty
Ribbon rack and measurer....E. A. Hooton
Road machine, Snow-....J. Warcup
Road-working machine....A. C. Callender
Rotary engine....F. Tompkins
Rotary engine....W. H. Reece
Rotary motor....P. J. Darlington
Rotary motor....E. R. Mills et al
Rubber-treating apparatus....E. Molina
Rule, Combination-....J. D. McCann, Jr.
Sand-blast machine....F. P. Boland
Sanding device....B. C. Loring
Sash-balance....C. M. Smith
Sash-fastener....N. A. Buckingham
Sash-lock....S. J. Newhart
Sash-lock and fastener, Combined.E. F. Kapus
Sash, Window-....J. Thenser
Saw-filing implement....J. H. Fritz
Sawing machine universal clamp, Cold-....J. McCarthy
Scraper....N. Keller
Screen....W. C. Logan
Screen corner-piece, Window-....G. E. Ferry
Screw-driver screw holder....S. G. North
Screws, &c., Machine for making.C. Y. Knight
Seam-ripper....T. F. Freeman
Semaphore-signal, Electric....G. W. Pettey
Separating-machine....G. H. Rich
Sewer-trap....B. Oakes
Sewing-machine embroidering and darning attachment....H. R. Prall
Sewing-machine needle-clamp....J. P. Weis
Shade and curtain hanger....J. E. Hopkins
Shade bracket, Window-....B. L. Young et al
Shade, Window-....J. M. Patterson
Shaft-coupling....W. B. Steen
Shaft-tug....F. T. Overman
Sheet-piling driving-cap....R. B. Woodworth
Ship-ventilator and connections thereto....E. O. Blackwell
Shoe draw-strap and horn....W. H. Carroll
Shoe-forming last....E. J. Bliss et al
Shoe-rack....M. C. Ryan
Shoe-stitching machine....H. A. Webster
Sign....C. S. Neville
Sign-holder, Street-light....A. E. Shaw
Signal....C. N. Brown
Sink garbage-drainer....J. Tyll
Skate-roller....T. W. Bryant
Skirt....M. S. Doty
Slack-adjuster....J. H. Dodson
Slot-machine....N. Gillies
Sodium sulfid, Making infusible.W. Hasenbach
Solid bodies from liquids by cooling, Apparatus for separating....P. Porges et al
Sound-records, Making...J. O. Prescott et al
Speed-indicator....C. A. Jacques
Speed motor, Variable-....J. Burke
Spoke-lathe....L. G. Robinson et al
Spraying apparatus...F. and F. Koenigkramer
Spring construction....C. Ruston
Spring-relief coaster....W. Van Wie
Square, T-....J. N. Whaley
Stage border-light....J. C. Bronaugh
Steam-engine....D. Farquhar
Steel mold, Manganese-....H. M. Howe
Stirring device....E. Weiss
Stoker, Automatic....J. M. Roe
Stool, Folding....C. A. Buffington
Storage battery....T. A. Edison
Storage-battery electrodes, Making....T. A. Edison
Storage-battery stand and means for raising and supporting plates, &c....O. H. Nelson
Stove draft apparatus....A. J. Kampe
Stove-lid....E. J. Renkenherger
Stovepipe-locking device....A. W. Hoyer
Stretcher-frame....C. P. Freestate
Suction-cleaner....O. H. Mohr
Sugar, Making....G. W. McMullen
Sullage from molten metals, Treating and utilizing....W. H. Carpenter
Sunshade for hats, &c., Collapsible.C. M. Baum
Suspenders....W. D. Corder
Suspensory sack or pouch....H. C. Shaw
Swing....C. W. Ifft
Switch-lock....T. Lycett et al
Switch-stand....E. N. Strom
Switch starter, Multiple-, 2 pats.H. J. Wiegand
Tag....W. G. Keene
Talking-machine mechanism....T. Kraemer
Telegraphy, Space....L. de Forest
Telephone-line testing system...C. S. Winston
Telephone-mouthpiece....W. Gibson
Telephone-transmitter....C. Adams-Randal
Telephone-transmitter....H. P. Clausen
Telephony....I. Kitsee
Tension device....E. Belcher
Thill-coupling....F. Dean
Thill coupling and support....A. E. Brown
Ticket-case....G. T. Haines
Tile, Drain-....W. H. Booth
Tins, Machine for forming....S. Opsal
Tire, Air-tube....J. Rees
Tire protective cover or armor, Pneumatic-....F. J. Moran
Tire protective device, Rubber-....H. W. Harding
Tool, Adjustable boring-....G. C. Barnes
Tool-holder....C. E. Bown
Tool, Tire-....W. James
Tooth, Stacker-....J. Dain
Torpedo-controlling means, Dirigible-....L. E. Custer
Torpedo firing means....C. Davis
Traction-engine....G. R. Goughnour
Train-order-delivering device...T. E. McCann
Trammel-point....A. Turnbull
Transmission mechanism....M. Bouchet
Tray....J. J. Karges
Tray, Foldable....C. F. A. Eddy
Trench or sewer digger....G. F. Rauch
Trimming and channeling machine, Combined....W. E. Small
Trolley frog and crossing....F. J. Venning
Trolley harp or pole....W. A. Dechant
Trolley-wheel....J. H. Giarth
Truck....H. E. Bown
Truck-brake....W. S. Adams
Truck, Traction-....R. Sylvester
Tube apparatus, Pneumatic-despatch-....C. F. Stoddard
Tube system, Pneumatic-despatch-....C. F. Stoddard
Tubes, Manufacture of, 2 pats....O. Briede
Turbine, Explosion-....P. O. Poulson
Turbine-motor....H. E. Kay
Turpentine-collecting apron and receptacle....E. R. Philip
Twisting-machine....J. L. Inman
Type-setting machine....W. W. Lininger
Type-setting machine....W. G. Reynolds
Type-writer....F. von Hefner-Alteneck
Type-writing machine....H. S. McCormack
Type-writing machine....H. H. Steele
Type-writing machine....W. H. Denning
Type-writing machine....L. P. Diss
Type-writing-machine calucating attachment....F. J. Tillman
Umbrella....T. F. Graham
Valve....J. A. Wolcott et al
Valve....J. A. Lawler
Valve....G. Peileke
Valve, Automatic...H. D. and W. B. Emmons
Valve, Check-....T. A. De Vilbiss
Valve device....C. Kroeschell
Valve, Filling-....E. E. Gold
Valve, Flush-tank supply-....J. S. Caldwell
Valve for expansion-drums, Filling-....R. M. Dixon
Valve, Gas-cut-off....J. S. Joseph
Valve, Piston-....J. Nolan
Valve, Radiator-....F. L. Watson
Valve, Steam-actuated....A. Mehlhorn
Vanner feed-distributer....C. P. Whitmore
Vehicle....T. V. Buckwalter
Vehicle....N. C. Whiting
Vehicle-body, Transformable....T. H. Buff
Vehicle brake, Tramway and railway.E. Jones
Vehicle lifting-jack....A. P. Cottrell
Vehicle, Motor road-....F. Surcouf
Vehicle steering-gear, Motor-....D. H. Coles
Vehicle steering mechanism, Self-propelled-....D. H. Coles
Vehicle-wheel cushion-tire....B. F. Fry
Vending-machine....E. L. Smith
Vending postage-stamps, &c., Machine for....A. Parker
Vessel, Navigable....W. Petersen
Vise and thread-cutter, Combined..A. T. Pflugh
Voting-machine....C. C. Abbott
Voting-machine....W. S. Prosser
Voting-machine grouping mechanism....C. C. Abbott
Voting-machine independent-voting mechanism....C. C. Abbott
Voting-machine uniform-paper-feed mechanism....C. C. Abbott
Voting mechanism, Cumulative-..C. C. Abbott
Vulcanizing apparatus....J. R. Gammeter
Wagon-dog....E. Law
Wagon, Dump-....W. H. Moore
Wagon-reach....S. O. Frantz
Washing-machine....P. Whyte et al
Washing-machine attachment....P. Miller
Watchcase-protector....J. B. Hale
Water, &c., Apparatus for straining....M. V. Roberts
Water-closet automatic flushing apparatus....W. H. Osborn
Water-closet flushing apparatus..W. H. Osborn
Water-closet-seat-hinge....J. C. Duner
Water-crane....R. A. Ogle
Water-heater....L. Stockstrom
Water, Purifying....H. Korten
Water-tank, Return....P. J. Grahn
Wave-motor....D. B. Rockwell, Jr.
Weeder....A. Barkley
Wheel creeping, Means for preventing an auxiliary....T. M. and W. Davies
Winding apparatus, Yarn-....P. Laubli
Window-leaning device....A. T. Bolland et al
Window-fastening device....J. L. Mallory
Window-screen....W. F. Gibbard
Wood-pulp and making same...C. Bache-Wug
Wool from its yolk and grease by electrical means, Freeing raw....J. M. Baudot
Woven fabric....I. E. Palmer
Wrapping mechanism....E. Scott
Wrench....S. S. Vaughan
Wrench and thread-cutter, Combination....N. Stiren

DESIGN.

Badge....W. E. Bush
Badge....W. H. Doyle
Badge, Souvenir....H. A. Bragg
Beam, Balance-....W. Huesser
Bottle....A. M. Perrault
Bottle casing, Perfumery-....G. Dralle
Bottle, Vacuum insulated....A. J. Kelley
Cabinet....H. Rosengard et al
Fabric, Pile....F. H. Walker
Fence, Wire....L. Swank
Mirror, Barber-shop....C. Pfanschmidt
Pipe-coupling....J. C. Vogel
Pipe, Smoking-....R. A. Zeltmacher
Ring....F. W. Ward
Rubber overshoe....F. C. Hood
Sachet or perfume container....E. Armant

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MECHANICAL PATENTS.

Abdomen-compress, 2 pats....T. P. Taylor
Abdomen-compress attachment for corsets....T. P. Taylor
Acid, Mercury salt of para-aminophenylarsinic....W. Güttefien
Addressing-machine....F. B. Walrod et al
Advertising device....G. M. Guerrant et al
Aeroplane....H. Mueller
Air-brake automatic coupling....G. Ripma
Air-moistener....C. G. McKendrick
Air-ship....J. T. Rice
Air-ship, Aeroplane....L. A. Becht
Alpha-halogen-isovaleryl-urea and making the same....E. Saam
Alumino-silicate or artificial zeolite....R. Gans
Amusement apparatus....B. J. Sagenhomme
Amusement device....J. Huebner
Amusement-steps....J. H. Cross
Animal-serum, Obtaining...R. H. Deutschmann
Animal-trap....A. N. Atkins
Animal-trap....W. M. Kaiser
Automatic fountain....A. G. Ionides
Automobile air-cushion....J. B. Taylor, Jr.
Awning....M. M. Cormeny
Ax, Brush-....F. Hammerly
Band-cleaner, Space-....W. H. Schuyler
Band-resaw and double jointer..J. McWilliams
Banjo hand-support....D. E. Hartnett
Barrel or keg and head therefor, Wooden....J. W. Brainard
Beam, Walking-....H. Shannon
Bearing....F. W. Salmon
Bed-bottom fabric....F. W. Kinney
Bed-clamp....A. T. Sawyer (Reissue)
Bed Settee-....J. Phillipson
Bedstead crib attachment....V. O. Crawford
Belt-coupling....J. Brenner
Belt-stretcher....A. C. Donell
Binder, Loose-leaf....C. L. Baldauf
Binder or loose-sheet holder, Temporary....H. F. Bushong
Binder, temporary....C. A. Hartmann
Blacking-box....C. E. Conder
Blade-holder....J. B. Duhring et al
Blanket-clamp....D. E. Coe
Block mounting, Swivel-....J. Ward
Block-signaling system....H. M. Coulter
Bobbin....J. R. Coe
Bobbin-holder....T. J. Murdock
Boiler and furnace, Combined....W. J. Ellis
Boiler-flue cleaner....J. J. Flynn
Boiler-furnace....J. C. Parker
Boiler-tube cleaner....E. Mettler
Boilers, &c., Protective covering for blow-off pipes of steam-....J. Beattie
Bolt-clipper....J. A. Alley
Book....E. Davis
Boot and shoe exhibiting device..E. Langenohl
Boot and shoe upper and box-toe therefor....H. C. Jenney
Boot or shoe form....J. S. Hansen
Boot and shoe internal cushion....J. Ramsay
Boring appliance....A. J. Signor
Bottle-labelling machine....N. Muslar
Bottle, Non-refillable....C. S. Thomas
Bottle, Non-refillable....F. Schmitz
Bottles, cans, &c., Powder-distributer and closure for....C. H. Van Rensselear
Box-fastener....R. Schleicher
Box-lid holder and box-opener....I. K. Bergquam et al
Box-making machine....W. M. Gentle
Bracelet, Expansible....W. S. Thornton
Bracket....H. Zimmerman
Bracket....F. A. Potter et al
Bracket-support....A. G. Crago
Brake-beam....R. H. Thompson
Braking device....V. Lamb
Bread-cabinet and cutting-knife, Combined....P. Nelson
Broom-holder....I. E. Sucher
Brush-cutter....P. P. Dick
Brush, Fountain shaving-....I. D. Stevens
Brush, Sieve-cleaner....A. R. Wiens
Brush, Stencil-....A. L. Nickerson et al
Brush, Tooth-....D. McEachern
Bucket, Dumping-....H. J. Russell
Bucksaw....F. L. Hemmer
Bullet....L. B. Taylor
Burial-vault-forming mold....A. O. Hunsaker
Burnishing-machine....M. Godlewski
Cake-press....E. Erickson
Calculating-machine....C. A. Meilicke
Calculator....A. G. Meier
Calf-muzzle....P. C. Roberts
Caloric-engine....C. L. Fortier
Camera, Photographic....L. Borsum
Can-heading machine....J. Brakeley
Can-opener....A. O. Hanson
Candlestick....R. F. Crooke
Car, &c., burglar-alarm, Railway-..G. Potter, Jr.

Car axle-box, Railway-....J. B. Arrington
Car-berth wall-pocket, Sleeping-...S. W. Clark
Car, Convertible amusement and dining.....
....C. H. Packard
Car-coupling....S. Sznutchko et al
Car door, Grain-....D. W. Thomas
Car draft-gear....N. H. Surenik
Car draft-gear, Railway....W. R. Matthews
Car drop-door structure....F. W. Bradley
Car, Dumping-....W. J. Chance
Car end construction, 2 pats..B. Julien et al
Car, Passenger-....E. T. Robinson
Car-stop, Automatic....J. J. Fleming
Car-ventilator....S. C. Carroll
Carpet-sweeper....F. C. Mason
Carriage-thill....W. H. Cooley
Carrier....W. Seegers
Carving-machine....F. H. Richards
Castings, Means for forming threaded openings in....J. Bedell
Check-controlled apparatus....C. E. Morris
Churn....F. E. Stagg
Cigar cutter and lighter....W. J. Crowley
Circuit-closer, Rotary....E. Lind
Circuit-controller operating mechanism.....
....N. W. Truxal
Cistern automatic cut-off....R. E. Estes
Clay-working machine....F. B. Lambert
Clock combined with coin-freed winding-up apparatus....A. G. P. Wiingaard
Clothes-pin....J. B. Anderson
Clutch, Electromagnetic....H. Ast
Clutch-operating mechanism....H. L. Turney
Coal-drill....J. S. Surbaugh
Coal or rock drill....G. G. Mayer et al
Coal-tipple....E. E. Bull
Cock, Gas-....C. H. Wiley
Cocoanut-grater....M. E. Hunt
Coin-delivery machine....S. Randell
Collisions at sea, Device for preventing.....
....G. Fischer
Column, girder, &c....J. W. Muldoon
Comb....G. W. Shadle
Comb, Hair-....C. E. Speck et al
Computing-machine....J. T. Uebbing et al
Concrete block....H. N. Pettigrew
Concrete frame for door and window openings
....J. H. and D. H. Magdiel
Condenser support, Steam-....L. R. Alberger
Conduit-receptacle....J. S. Stewart
Container, Single-opening safety-..W. Asbury
Conveyer apparatus..H. B. and J. A. Sauerman
Conveyer-roller ball-bearing...S. L. Goldman
Cooking or heating utensil..E. W. Hamburger
Corn-planter, Automatic....F. N. Adams
Corset, Apparel-....D. Kops
Corset-lacing device....M. B. Gardner
Corsets, Means for pinning down waists to..
....S. Kops
Cotton-chopper....C. Winkler et al
Cotton chopper and cultivator.....
....A. M. and J. W. Thompson
Cotton-seed separator....J. T. Cox
Cream-separator liner, Centrifugal.....
....C. H. Hackett et al
Cream-separators, Cream-exit for centrifugal...
....C. H. Hackett
Creeper....J. Auer
Cross-tie....S. Michaels
Cultivator....E. Hainman
Cultivator....A. Brigden
Cultivator, Disk....J. S. Bukacek et al
Cultivator, Garden-....J. T. Anderson
Culvert, Corrugated metallic....H. Mallery
Curling-iron, Electrically-heated..B. Y. Snyder
Current-indicating apparatus....J. S. J. Lallie
Current-motor....E. Imboden
Curtain-pole....J. B. Phinney
Curtain-supporter....L. Nachmann
Cuspidor, Flush-....J. W. Cooper
Cutting, piercing and marking pen-machine....
....W. J. Naphey
Cycle....C. S. Johnston
Dam....W. G. Fargo
Dam-crest, Automatically-movable..H. Büchler
Delivery mechanism....A. J. Ford
Deodorizing and disinfecting device.....
....A. G. Walter et al
Derrick pile-driver....G. T. Forsyth
Detinning....F. von Kugelgen et al
Die-stock, Adjustable....I. W. Nonneman
Dipping-machine....W. B. Crocker
Disinfecting apparatus....V. A. Williams
Disks, Cutting....D. P. Robinson
Door-catch....C. R. Cochran
Door-catch....H. P. Connor
Door-controlling device....I. Filson
Door hanger, Car-....J. E. Hill
Door-lock, 2 pats....F. P. Pfleghar
Double-acting clamp....J. M. Goodknight
Dough-raising apparatus....H. H. Young
Drainage-level....P. Gutwein, Jr.
Dressmaker's gage and stand..W. A. De Garis
Drill adjusting device, Grain-...W. F. Jacobs
Drilling-machine....W. C. Brown et al
Dust-pan....C. Gabel
Dynamite, Machine for packing explosive gelatin....W. I. Donaldson
Dynamite-shell-machine folder.....
....J. A. Johnston
Electric accumulator-plate...C. F. Guyon et al
Electric cigar-lighter....J. W. Todd, Jr.
Electric controller....F. E. Case
Electric current and voltage regulator.....
....S. B. Storer
Electric furnace....S. F. Hall
Electric igniter-switch, Automatic.....
....C. L. Vannort
Electric-light cord or cable adjuster.....
....F. E. and A. C. Walker
Electric light, Portable....G. R. Radley
Electric switch....S. G. Read
Electric switch-lock....W. P. Neubert
Electric-switch shunt-contact....W. M. Scott
Electrical insect-destroyer....P. J. Peterson
Electrically-operated brake....C. Saunders
Electricity, Device for vending...E. Evans
Electricity-rectifier....T. J. Murphy
Electrode for arc-lights....C. P. Steinmetz
Electrolytic apparatus....O. Meyer
Electrotype-plates, Backing....G. E. Dunton
Elevating and cleaning material of a granular nature, Apparatus for....F. Beduwé
Elevator and mine-cage breakaway-clutch.....
....M. C. Hutchings
Embroidery-needle, Machine....C. F. Mack
Engine electric ignition apparatus, Internal-combustion-....C. H. Thordarson
Engine explosive mixture, Combustion-.....
....P. Winand
Engine....J. H. Smith
Engine starting mechanism, Internal-combustion-....F. W. Teves
Engine steering device, Traction-...A. Harrold
Engineer's alarm....E. McClintock
Envelop....W. D. Smith
Envelop-seal....H. Bennick
Explosive-engine....R. McMyers
Eyelet....F. A. Donnelly et al
Fabric and weaving the same, Tubular.....
....E. Kunzli
Fabric bleaching and dyeing machine..G. Collis
Fan, Electric....A. T. Hoevet
Fare-box, Registering....C. E. Gierding
Faucet....W. C. Winfield
Faucet and combination thereof....F. J. Firth
Feeder, Poultry-....J. W. Harper
Fence-post....W. A. Oliphant
Fender....J. W. Sprint
Filing system, Vertical-....J. B. Perrine
Film-frame carrier, Adjustable...E. Biechele
Filter....C. R. Perry et al
Filter-press plate....J. W. Biles
Fire-escape....G. H. Johnson
Fireproof floor (I-beam construction.).....
....D. H. Magdiel
Fire-protection system....H. B. Helm
Firearm auxiliary stock....H. Renfors
Fish-hook....C. W. Bradley et al
Fish-hook....C. M. Willis
Flask, Molder's....J. F. Lamb
Flue-stopper....M. M. Stearling
Fluid circulating and cooling apparatus.....
....A. R. and R. S. Welch
Flushing apparatus....J. E. Longstreet
Food product and making same....A. Behr
Frame for molders' use, Extensible..J. F. Lamb
Friction-insert for braking-surfaces.....
....F. C. Miller
Fruit-picker....G. L. Nixon
Fruit-stand, Folding....J. H. Sabo
Fuel, Compound....A. D. Shepard
Furnace-charging apparatus, Blast.....
....R. H. Lee et al
Furnaces, Apparatus for feeding flour iron ore to blast....E. L. Harper, Jr.
Furniture, Adjustable....E. G. Watkins
Furniture, Article of....E. Werner
Furrow-opening attachment....O. F. Orndoff
Galvanizing-machine....H. A. Hall et al
Game apparatus....T. J. Glenn
Game register, Pool and billiard...O. Johnson
Garbage-receptacle....J. M. Thinnes
Gas-conduits, Combined liquid separator and indicator for....R. L. Dezendorf
Gas, Generating....C. E. Lucke
Gas-producer....C. E. Lucke
Gate-frame hinge....A. S. Mackey
Gate-operating mechanism, Automatic.....
....D. W. Patterson
Gear, Friction-transmission.....
....F. J. and E. D. Rice
Gear, Reversing-....E. L. Smith
Gearing, Changeable-speed....W. Morrow
Gears, Forming herring-bone..N. A. Christensen
Gears, Means for casting....J. S. Barnes
Glass-drawing apparatus....J. H. Lubbers
Glass gathering and shaping machine.....
....G. W. Graves et al
Glass, Making decorated....J. D. Kyle
Glassware-carton....L. H. Peltason
Golf apparatus, Captive....R. B. Peter
Grain-separator....T. C. Vaughan
Grain-shocking apparatus....J. Calder
Gramophone....L. T. Haile
Grapple....J. B. Castagnos
Gravity-conveyer, Automatic....S. Hedrain
Grinding device....W. S. Hannan
Grinding-machine....G. F. Taylor et al
Hame....J. Wittner
Hammer and hammer-support....J. E. Akin
Hammer drop-board, Drop-....W. E. Firth
Hamper, Hanging....M. L. Froehlich et al
Handle-fastening....H. V. Jones
Harness hanger and stretcher, Combined.....
....J. Billmyer
Harvester, Corn-....S. Mohler
Harvester device....W. L. Griffin
Harvester snapping-roller, Corn-...J. A. Stone
Hat-brim press to form welt edges.....
....C. E. Sackett
Hay-stacker....C. W. Davis
Head-rest....W. N. Greer
Heater....G. L. Fogler
Heater....L. B. Piper
Hedge-trimmer....L. Kitsch et al
Hedge-trimmer....D. F. Roche, Jr.
Heel-building machine....A. M. Simmons
Hinge....A. Krauth
Hinge and article-hanger, Combined.....
....H. G. Bryant
Hoisting attachment and cornice-protector.....
....J. H. Marvin
Horn, Amplifying-....C. Beccroft
Horse-detacher....J. S. Williams
Horseshoe....C. Wermstrom
Horseshoe....A. F. Paulsen
Hot-air register....C. K. Clark
Humidifying and air condtioning apparatus....
....S. W. Cramer
Hydraulic motor....J. G. McDowell
Igniter....I. H. and J. B. Mantion et al
Illuminator....V. R. Lansingh
Index....L. L. Dennick
Indicator contact-maker, Helm-...F. W. Wood
Insect-trap....C. A. Heath et al
Insecticide....J. W. Lafer
Insole-cleaning machine or device.....
....J. F. Noonan
Internal-combustion engine....A. L. Galusha
Invalid's supporter....E. I. Boyce
Iron-cutter....W. R. Walker
Ironing-board....A. Kenan
Ironing-machine....H. G. Grosse
Ironing-machine....G. L. Martin
Jar or bottle stopper....A. P. Lee
Joint chair, Railway-....D. C. Miller
Journal-box-lubricating device...J. G. Smith
Kinetoscope....J. Keller
Ladder....A. H. Loomis
Lamp....P. Heylandt
Lamp, Arc-....W. F. Warner
Lamp, Arc-....W. R. Whitney
Lamp, Electric-arc, 2 pats....C. Oliver
Lamp, Electric-arc....R. Fleming et al
Lamp, Hydrocarbon incandescent..H. H. Eason
Lamp, Spirit-....S. N. Turner et al
Lamplighter....J. I. Bond
Land roller and pulverizer....W. Pfarrer
Lantern, Tubular....W. C. Winfield
Lantern view-changing device, Magic-..J. Keller
Last....S. A. Baker
Lasting-machine....A. J. Gabrielian
Lead hollow bodies, Uniformly covering with..
....V. Schwaninger
Lens-grinding apparatus, Bifocal-....B. Mayer
Life-preserver....E. O. Stapp
Light, Binnacle-....B. V. How
light fixture, Portable electric-.....
....L. A. Williamson
Line-support....J. D. Hilliard
Lock....R. Kádar
Lock....E. Gragnon
Locomotive-bells, Means to prevent overturning of....C. H. Foster
Locomotive-boilers, System of washing and filling....S. Otis et al (Reissue)
Loom shuttle-box motion....J. M. Marco
Loom stopping mechanism, Automatic-replenishing-....R. Jamieson
Loom-temple....J. E. Prest
Lubricator....L. Schriever
Lubricator for handsaws....C. E. Lowe
Lumber-rule....J. N. Bryant et al
Mail-bag deliverer and receiver..D. W. Millsaps
Mail-catcher attachment..R. W. Crawford, Jr.
Mail-crane....I. Light
Mail-delivering apparatus....D. B. Harmon
Mail-delivering apparatus....J. H. Tudor
Manicure implement....B. M. Smith
Maps, &c., Assisting forecasters in the preparation of weather-....A. G. McAdie
Masonry and steel structure....R. Gustavino
Mechanical motor....W. J. Comfort
Megaphone and horn, Combination..C. W. Wolf
Melting-furnace, Crucible....C. Smerling
Merchandise-hanger....S. S. Weaver
Metal-bearing material, Treating precious-....
....S. S. Sörensen et al
Metal-ladle, Molten....A. E. Maccoun et al
Metal window....G. H. Forsyth
Metals, Casting....M. V. Smith
Micrometer-gage....L. Mastrangel
Milk-concentrating apparatus...E. E. Claussen
Mining machinery....E. S. Bennett
Miter-box....E. W. Whitmore
Mixer....A. M. Monday
Mold....J. H. Finkle
Molds for electrotypes, Preparing.....
....G. E. Dunton
Molded receptacle....H. B. Smith
Molding-machine....F. A. Whitmore
Monocycle....S. A. Morris
Mortising-plane....I. W. Letner
Motive-power apparatus....C. J. Lake
Motor controller, Electric-....T. S. Perkins
Motors of motor-cars, Cooling device for the..
....M. Goudard et al
Mower-guard sharpener...C. and G. F. Batke
Mowing-machine for railway use..O. L. Olson
Mud-guard....J. X. Davis
Music-roll spool....W. S. Denton
Musical-instrument duplex tracker-board, Automatic-....M. Clark
Needle-shower....W. E. Holmes
Nitric oxids and nitric acid, Producing.....
....O. Dieffenbach et al
Nozzle....C. G. Hess
Nut-lock....T. J. Glenn
Nut, Lock-....W. Davis et al
Nut-lock, Adjustable....F. Young
Nutting-machine....J. V. Culliney
Optical-illusion device....F. J. Wiedenbeck
Ore-dust from furnace-gases, Apparatus for removing....C. E. Briney
Ore, galvanizer's dress, and the like, Apparatus for use in smelting zinc..E. H. Hopkins
Ores, Reducing....N. Wikström
Ores, Treating complex sulfid..G. E. Kingsley
Ores, Treatment of....A. L. Dean
Oxid of iron and zinc sulfate, Preparing red..
....G. Evans
Ossein, Treatment of...E. A. A. Vallée et al
Oven, Coke-....J. F. Donaghy
Oven continuous heat-interchanging arrangement, Coke-....E. Solvay
Package-clasp....T. Smith
Package-tie....L. A. Strom
Packing....S. M. Jones
Packing ring, Metallic rod-...C. W. G. King
Paper....M. B. Diskin
Paper-making machinery, Contracting reel for.
....E. J. Pope
Paper-sack holder, Wire....A. H. Jones
Paper-shell machine....J. Chesney
Paraffin on butter-tubs, Device for spraying..
....L. A. Rogers
Peat by air-currents, Process and apparatus for drying....H. von Morsey-Picard et al
Phonograph-horn....G. W. Duncan
Photographic-printing apparatus...T. T. Sabroe
Piano-players, Pneumatic for automatic.....
....H. M. Brod
Pick and crowbar, Combined....J. Weis
Pipe-line-cleaning device....H. A. Greenan
Pipe-making machine....W. Jangenheim
Pipe or culvert joint....J. P. Zimmer
Pitman connection for shakers.....
....A. L. Parrish et al
Placket-closure....E. A. Thomas
Planing-machine, Rotary....E. J. Hannum
Plant-protector....J. P. Duval
Planter....E. St. Aubin
Planter, Corn-....M. R. Moffitt
Plastic material and making same.....
....W. E. Carson
Platen-press....J. Thomson
Plates for X-ray machines, Manufacture of generating-....H. H. Williams
Plow....W. L. Paul et al
Plumber's clamp....R. D. McDonald
Plumbing-fitting....N. G. Goreau
Pneumatically-operated device....W. C. Smith
Pocket-knife and opening-key therefor.....
....J. H. Wilson
Polishing-machine....P. H. Barz
Polishing material to buffing-wheels, Device for applying....F. M. Levett
Postal-card check....E. P. Selden
Postmarking-machine....D. Robertson
Potato-planter....J. R. Fruit
Poultice case or container....H. J. Dunn
Powdered-material feed-regulator.....
....D. M. Pickett
Power system, Water-....S. C. Fancher
Power-transmission elements, Mechanism for controlling....J. D. Allen et al
Power-transmission mechanism...R. D. Mayo
Prepayment-meter....W. T. Drew
Pressure cut-off....G. Robson
Press and attachment therefor, Drop-.....
....L. G. Brayer
Pressure-exerting machine, Relief mechanism for....W. A. Cornbrooks
Pressure to tanks and other appliances, Apparatus for controlling the application and relief of....A. Priestman
Printing-press lock-up device....G. Kaysser
Propeller....M. B. Miller
Pump counterbalancing device....C. K. Cotten
Pump, Double-acting....F. J. Pratt, Jr.
Rack guard, Veil-....M. D. Coey
Radiator....M. E. Danforth
Rail....G. B. M. Erwin
Rail and beam tie....A. R. McDade
Rail-bond....F. H. Daniels
Rail-joint....C. O. Thomas
Rail-joint....W. Kolling et al
Rail, Shifting....D. W. Connell
Railway and like vehicle bogie....A. Spencer
Railway automatic danger and safety signal system....A. F. Eells
Railway automatic electrical signaling system..
....C. Crandall
Railway-crossing signal....G. A. Davis
Railway electric block system...C. H. Shaffer
Railway rail-driving device....A. F. Fiala
Railway-rail tie-bar....J. H. Crowley
Railway-signal....H. A. Hoeschen
Railway signal means....T. W. Stanage
Railway-switch....H. Reed
Railway tie and fastener, Metallic....S. Clary
Rake automatic cleaner, Push-...C. H. Russell
Rake lever mechanism, Sweep-....D. Plattner
Rammer, Paving....N. C. Qvist et al
Razor....S. Illis
Razor-blade holder....F. C. Gorham
Razor, Safety-....B. Klam
Reamer....J. Gallagher
Reciprocating motor....J. G. McDowell
Respirator....G. F. Jaubert
Reversing-switch....J. Dalziel
Ribbon-roll clasp or guard....T. H. O'Brien
Ring-tray, Safety....C. E. Fowler
Rim-compressor....A. F. Hansen
Rock-drilling engine....J. G. Leyner
Rod connection, Tie-....P. Monson
Rolling-mill....F. C. Biggert, Jr.
Rotary engine....J. S. Alcorn
Rubber heel, Removable....J. H. Dempsey
Saddletree....B. F. Amos
Sand-blast machine....E. P. Boland
Sap-spout....W. W. Powell
Sash balance, and lock....F. D. Anthe
Sash-lock....C. E. Hennies
Sash-lock....W. F. Webber
Sash lock, Window-....D. Reinmiller
Sash-fastener....N. Marschall
Scraper, Wheeled....A. H. and L. L. Smith
Screen-hanger, Eaves-trough....W. Feyler
Screw-driver....A. Whistler
Seal-press....H. C. Pomeroy
Self-locking box....E. K. Davis
Selvage-holder, Float-filling....J. Hargreaves
Sewing-machine tape tension device..C. Weiss
Shearing-machine....F. H. Daniels et al
Sheet-metal, Gang-die for cutting.....
....D. P. Robinson
Shelving....G. Holden
Shelving....B. L. Waters
Shipping-package holder....S. Bonini
Shoe....A. J. Gabrielian
Shoe attachment, Rubber-..H. J. Bracken et al
Shoe-holder....G. E. Hart
Shoe-lacer fastener....C. J. Anderson
Shoe-tying device....P. K. Snyder
Shoes, Making....S. A. Baker
Shovels, spades, and other tools, Handle for..
....F. Skelton
Shutter-bower, &c., bracket....H. Zimmerman
Shuttle....R. Crompton
Sign....C. E. Malmquist et al
Sign, 3 pats....S. L. Aarons
Skates, Removable brake and guard for roller-
....A. R. Rieger
Skidding machine, Log-....T. S. Miller et al
Skirt....W. W. Hook
Skirt-gage....C. Wetz
Sleigh-runner....W. E. Turner
Slicer....F. P. Dunn
Slotting device....O. O. Storlie
Smoking appliance....F. A. Tarara
Smoking-pipe, Dry....F. Müller
Soap-holder....W. R. Vandewerker
Sock-supporter....S. W. Bishop
Sound-damper....E. Renz
Spark-plug....A. V. Pellet
Spark-plug....F. J. Watt
Speed mechanism, Variable-..A. L. De Leeuw
Speed-recorder, 2 pats...E. A. Henkle et al
Speed-recorder....C. H. de La Monte et al
Spindle....J. R. Coe
Spindle-locking mechanism....L. Thiel
Sprinkler-system automatic alarm..G. O. Haskell
Sputa-cup and holder....F. C. Jonah
Station-indicator....C. B. Casner
Steam-generator....C. L. Thudichum
Steel....H. D. Booth
Stirrup, Safety-....J. A. Batson
Stock-fountain....J. B. Hawkins
Storage battery....E. C. Ekströmer
Stove....E. R. Cahoone
Stove, Coal-burning....G. G. Kaiser
Stove, Heating-....E. R. Cahoone
Stovepipe....E. U. Phillips
Stovepipe-thimble and flue-stopper.....
....D. G. Lilley
Stump-extractor....J. Bradley
Sugar-cane mill....J. and C. McNeil
Sulky....T. Wilson
Suspenders....W. Freeman
Switch....C. D. Rolfe et al
Syringe....H. F. Ong
Syringe....J. R. Harris
Table....O. J. Rogers
Tag....W. L. Hall
Talking-machine....H. P. Valiquet
Talking-machine....D. S. Edmonds
Tanks and other appliances, Apparatus for controlling the admission and relief of pressure to....E. C. Moore
Tanks, &c., Overflow for pressure-.....
....W. H. Ridgway
Tanning composition....I. I. Burrows
Telegraph-repeater....G. L. Rawdon
Telegraph system, Multiplex....T. Giara
Telemeter, Stereoscopic....C. von Hofe
Telephone-disinfector....M. A. Dohney
Telephone lock-out, Party-line-.....
....W. F. Wagner et al

Telephone registering mechanism.....V. D. Greene et al
Telephone system.....F. W. Wood
Teleseope sighting attachment, Transit-.....G. N. Saegmuller
Thermostat.....G. A. Moore
Thill-coupling.....C. N. Jackson
Tie attachment.....W. T. Hulscher
Tile.....J. A. McKee
Time-indicating device.....S. P. Thrasher
Tire, Vehicle-.....W. D. McNaull
Tire, Wheel-.....J. Christy
Toilet artiele.....H. Straus
Tongue-depressor.....E. Hubbell
Tool, Combination-.....E. H. Nylin
Tool, Engraving.....H. W. Wells
Tool, Fluid-pressure.....F. Polzer
Tool sectional tubular handle.....W. H. Cooley et al
Tool tubular handle.....W. H. Cooley et al
Track-joint.....H. A. Meyers
Track-sander.....C. W. G. King
Train-controlling mechanism.....J. G. Schlee
Tramway, Aerial.....C. A. Dunlavy et al
Transformer.....H. B. Smith
Transformer structure.....C. L. Fortescue
Trigger mechanism, Single-.....J. D. Russ
Trolley-base.....J. A. Hanson
Truek.....J. F. King
Truck, Casket-.....C. H. Lannert
Truck, Tongue.....J. A. Stone
Tunneling-machine, Rotary.....C. A. Case
Turbine, Fluid-.....F. E. Wolf
Type-writer ribbon-movement.C. S. Niekerson
Type-writing machine.....B. C. Stickney
Type-writing machine.....C. S. Nickerson
Type-writing machine.....A. T. Brown
Type-writing machine.....E. F. Kunath
Type-written documents, Method and apparatus for duplicating.....M. Soblik
Umbrella.....E. A. Loomis
Vacuum-gage.....H. W. Maurer
Valve.....E. H. Gold
Valve.....F. Schreidt
Valve.....N. C. Walterthum
Valve, Automatically-elosing.....E. Bech
Valve, Balanced.....J. T. Wilson
Valve, Balanced slide-.....J. T. Wilson
Valve, Compressor.....N. A. Christensen
Valve, Dry-pipe.....G. I. Rockwood
Valve, Engine-.....B. V. Nordberg
Valve for steam-radiators, Automatic.....I. Hutchins
Valve mechanism.....A. W. Wilkey
Valve mechanism.....O. Bartel
Vault-closure.....T. F. Kelly
Vault-door.....J. C. Sparrow
Vehicle.....J. Repetto
Vehicle-axle swaging-machine....F. M. Caesar
Vehicle-chock.....A. L. Swearingen
Vehiele extension-top.....W. Leppert
Vehicle, Motor-.....N. S. Dunaway
Vehicle pneumatie buffer, Self-propelled.....M. P. Hayward
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Medal or emblem.....J. L. Charbneau
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Accelerating-controller, Automatic.....H .F. Stratton
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(Continued in May Number.)

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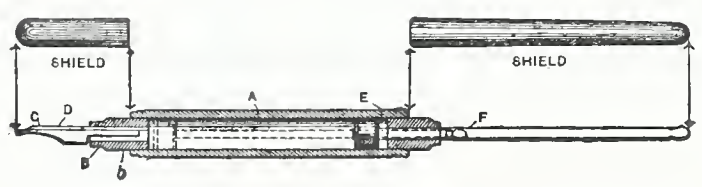
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ENGLISH FIRST-CLASS BATTLESHIP SOLD AS OLD STEEL

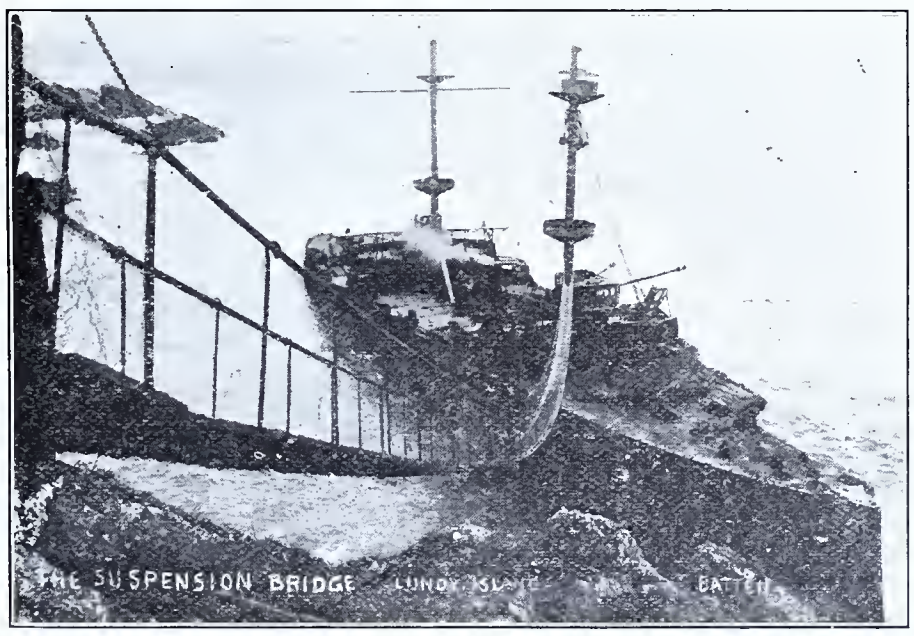
By C. VANLANGENDONCK.

THE efforts first to save, and later to break up, the wreck of the English battleship Montagu, are of sufficient interest to warrant description. A couple of years ago, this first-class 14,000 ton ship went ashore on Lundy Island, in the British Channel. A few hours after the vessel grounded, practically every compartment in the ship was full of water. At high tide the water rose about two feet above the upper deck at its lowest part, while at low tide it fell to about seven feet below the usual waterline.

The vessel rested on a rocky bottom, the general surface being fairly level, but with many pinnacle rocks. The damage to the bottom was serious, a large rock having penetrated about ten feet into the ship.

The task of salving was assigned by the British Admiralty to Admiral Wilson, and although a failure, the history of the operations is a record of persistent fighting against insurmountable difficulties. After a complete examination of the ship, it was decided to pump the water out as far down as possible by pumps driven by compressed air. Before this was done the battleship was lightened by removing the 6-inch and smaller guns, torpedo nets, chain cables, etc. Owing to the surrounding rocks and shallow water, only lighters or very small vessels were able to approach to the wreck. This added greatly to the difficulty of the operations, as in most cases heavy weights, such as boilers, etc., had to be first hoisted into lighters. One of these craft containing four 6-inch guns and several torpedo nets, in being towed was carried by the current over the rocks and foundered. She was, however, successfully salved some weeks later.

Within a few weeks after the disaster over 20 centrifugal pumps were in action, with a total pumping capacity of 8,600 tons per hour. Their object was to command the different compartments in which they were placed, and in general to clear the water down to about two feet above the platform deck. Although it was found that in many ways the minute subdivision of the ship helped the salvage, it made the work of pumping more difficult. To prevent the vessel bumping at high water, it was generally necessary to let her fill up with water, and arrangements had then to be made to pump out the various compartments rapidly, say in about eight hours. It was not practicable to provide special pumps or suctions for all the minor compartments, and time did not permit of the suction pipes being moved from one compartment to another. Drain holes had therefore to be cut—mostly under water—to enable the smaller compartments to drain into the larger ones, where pump suctions were fitted.



WRECK OF THE MONTAGU WITH SUSPENSION BRIDGE.



MANNER OF SUSPENDING THE BRIDGE ON LAND SIDE.

The next task was the covering over with plates of the hatches to the engine and boiler rooms. Then a number of tanks were fixed alongside of certain portions of the ship. It was estimated that to float the vessel safely, a plant capable of producing 6,000 cubic feet of air per minute would be required. It was obtained, but failed to respond to the gallant efforts of the salvage operators.

After nearly fifteen months' strenuous efforts to refloat the warship, the Admiralty decided that the task was hopeless and abandoned it. Before doing so the vessel's heavy guns, a large quantity of her armor plates, boilers, machinery and chain fittings were removed. The wreck was then purchased for a lump sum by a South Wales syndicate, which hoped to secure the valuable steel and iron composing the hull.

The first work of the engineers was to lay an aerial footway from the top of Lundy cliffs to the roof of the chart house on the wreck. The bridge shown in the photographs is between 300 and 400 yards long, and is composed of wood laid on four 5½ inch steel ropes of the best quality. The moorings are bars of steel, 4½ inches in diameter, bored into the solid rock. The weight of the whole construction is less than 20 tons. This bridge enabled men to go to and from the vessel quickly and safely at any state of the tide.

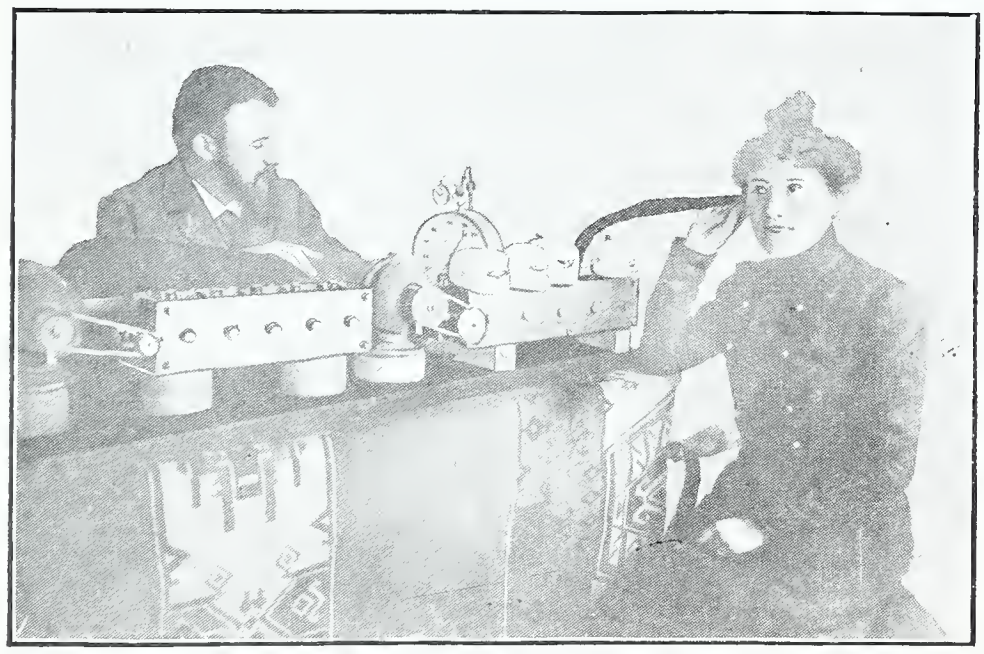
The main deck of the ship was always awash at high tide; therefore work could only be carried on for a short time daily. When weather permitted, small steamers were brought alongside the vessel, and piece by piece huge sections of the armor plating were transferred to the shore.

Although the work was pushed, it was several months before the wreck was completely broken up.

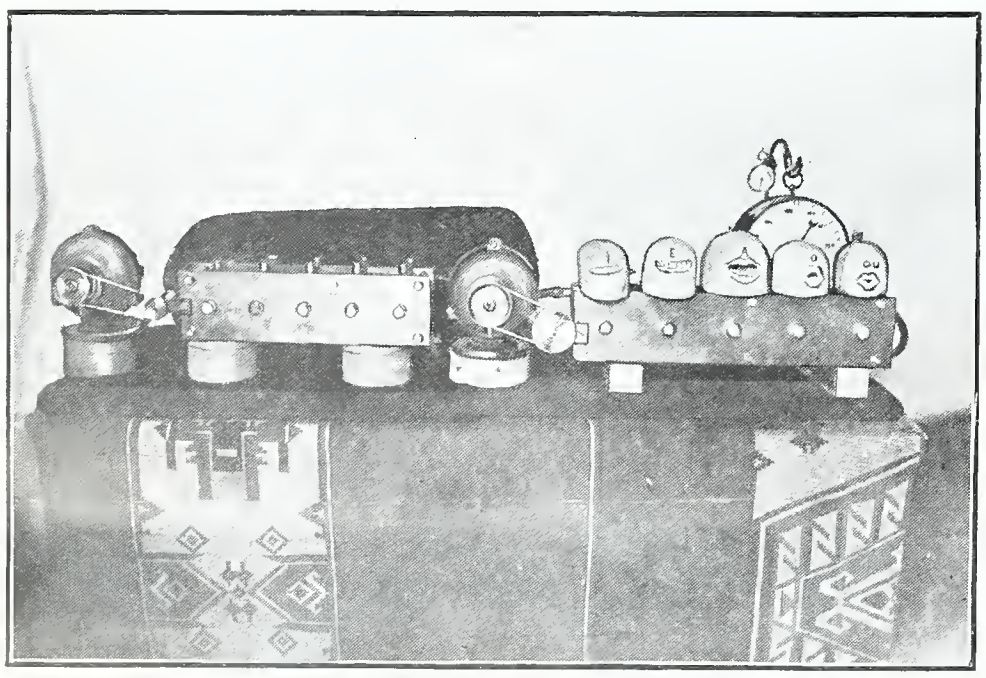
ELECTRIC TALKING SIREN.

By Frank C. Perkins.

A French scientist, Dr. Marage, of Paris, has constructed a special apparatus for teaching the deaf how to hear, that may be described as a talking siren; that is to say, a siren which produces sounds accurately imitating those of the various vowels both when sung and spoken. The inventor intended primarily to design an apparatus for gauging the sense of hearing in different individuals. The devices called "acoumeters," previously constructed for the purpose, may be divided into three classes, producing respectively noises, musical vibrations, or the vibrations of spoken words. Many persons have a rather limited capacity of hearing ordinary speech, but are able to hear distinctly either musical vibrations or noises.



DR. MARAGE TREATING A PATIENT WITH HIS TALKING SIREN.

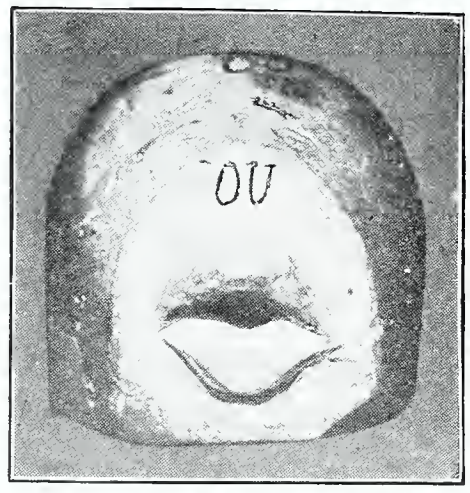


VIEW OF TWO SETS OF SIRENS, GIVING THAT ON THE LEFT THE VOWELS WHEN SUNG, AND THAT ON THE RIGHT THE VOWELS WHEN SPOKEN.

The reason is to be found in the more complex character of spoken words.

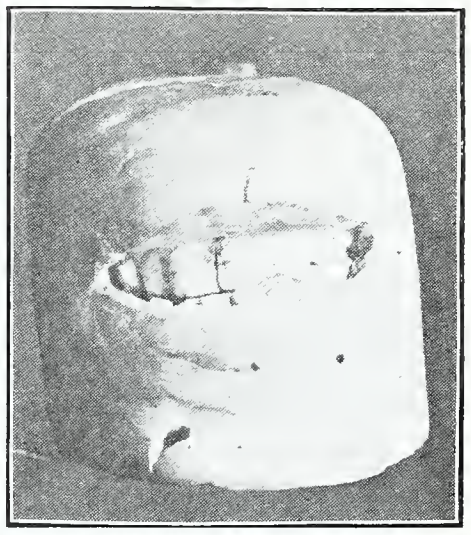
Dr. Marage has made a careful study of the human tongue, lips and teeth and their position in producing the various vowels, and has constructed artificial mouths, as shown in the illustration, for producing the vowelsonnds, a,e,i,o,u. His apparatus comprises an electric motor for the operation of the device, together with rheostat and switches for connecting with an ordinary lighting circuit, a manometer, and mouthpieces for producing the vowel sounds. A rotating circular disc is provided with slots cut in groups, and when air is blown through these slots the vowels are distinctly heard, the sound being that produced in singing. With the special molds resembling the human mouth, the spoken vowels are obtained, the artificial mouths having the lips and teeth in precisely the same position as they would be in the human mouth, in pronouncing the vowel. (See cuts.) The siren produces sounds the intensity of which is proportional to the pressure of air, and can therefore determine precisely the keenness of hearing of different individuals.

A sensitive metallic manometer indicates the pressure, the sound intensity being gradually increased with the increased pressure of air, while the ear to be tested is placed at a distance from the instrument. The inventor has prepared tables of auditive acuteness beginning with the perception of the ticking of a watch at a distance. The pressure as indicated on the manometer varies with patients who hear no general conversation or lose many words in the same, those who hear persons talking distinctly at normal distances, those who hear only when talked to close to ear and those who hear with the aid of a tube.



ARTIFICIAL MOUTH FOR PRODUCING FRENCH SOUND "OU" (ENGLISH "OO")

With this unique device an accurate gauge, as may be seen, can be obtained of the deafness of a patient. The talking siren is said to be not only valuable for diagnosing the troubles but also for curing the same. It is maintained that by systematic treatment, producing the sound required before the tympanum of the ear of the patient, the normal hearing capacity has been restored in many cases. It is also claimed by Dr. Marage that the siren has been utilized successfully in teaching deaf-mutes how to hear, the more simple elements of speech being taught at first by this device. A number, he says, have been taught to hear by this means, which indicates that there is a vast field of usefulness for this apparatus in the medical profession.



ARTIFICIAL MOUTH FOR PRODUCING THE FRENCH SOUND "I" (ENGLISH "E"

English Patent Laws.

The Lancashire Watch Co. Ltd , Prescot, England, is prepared to manufacture Gas, Water and Electrical Meters, Time Recorders, Taximeters, Automatic controllers and patented mechanisms of all descriptions.

The Safety of Ocean Travel.

Travel by ocean is less dangerous than travel by land. Anomalous as it may seem, it is safer to trust your life upon the watery depths than it is to cross the continent. The percentage of deaths, in proportion to the number of travellers, is smaller on the unstable element than it is on dry land. And if this has been true in the past, it is much more certain to apply in the future, when passenger-carrying ships will be equipped with wireless and when other safety devices will make ocean liners almost invulnerable. In spite of the characteristic mania for speed, safety is the first consideration in the equipment of steamships. Every possible safeguard is provided, and engineers in the employ of the transoceanic companies are kept busy experimenting with new devices to promote security. Every modern vessel is equipped with elaborate electrical apparatus, the central station being on the bridge, where the telephones, indicators, dials, thermostats, and various other apparatus are under the eye and finger of the responsible officer. Every detail is complete, even to tiny lamps which show, at night, when the white top lights and the red and green lights to port and starboard are burning properly. Switches govern the calls for the engineers, the firemen, the stewards or sailors. A clockwork arrangement blows whistles at regular intervals during a fog. The engine telegraphs record the commands of the captain in the engine room immediately, and ring back a signal, so that there is no possibility of error. By means of the engine telephones, the voice of an engineer talking in the depths of the vessel, five stories below the bridge, can be distinctly heard 20 feet away from the receiver. Other telephones connect the bridge with every part of the ship, from the lookout in the crow's nest to the quartermasters aft. One small wheel is intended for use if any one falls overboard. At the first alarm, the officer on watch turns the wheel, and this causes life rings to be thrown into the water, equipped with tubes containing a chemical which bursts into flame, visible for a distance of miles and burning for a hour or more. This shows the man struggling with the waves where he may find assistance, and the life rings help to sustain him until boats can be lowered from the vessel.

Fire at sea, that most ominous of perils, is made negligable by the new equipment. A thermostat, connected with a frame filled with little squares like the indicator in a hotel, is connected with other thermostats placed all over the ship. The instant the temperature in any spot rises beyond a certain point, a bell rings on the bridge, and in the square on the indicator to correspond with the location

of the thermostat, a red light will flash. Fire signal boxes are also scattered over the vessel, and regular stations equipped with hose, automatic fire extinguishers, and all other accessories. The crew are carefully trained in fire drills, and wear smoke proof helmets into which oxygen in pumped. All modern boats, too, are equipped with a system for forcing steam into the holds for the extinction of fire.

The watertight bulkhead is not a new device, being now in general use; but it is being made more efficient year by year. The ship is protected with a double bottom, extending the entire length of the vessel, and divided into a varying number of compartments—twenty six, in large steamers—while the hull has 16 transverse bulkheads reaching to the upper deck and one longitudinal bulkhead separating the engine rooms. All the bulkhead doors below the water line may be closed within less than 20 seconds, by the turn of a wheel on the bridge. This is done by means of a hydraulic pressure main, running the entire length of the boat, connected with an accumulator charged with compressed air, water and glycerine at a pressure of 800 pounds to the square inch, a pump which automatically maintains this pressure, and cylinders with enclosed pistons, beside each bulkhead door. By simple gearing these cylinders transmit the pressure, closing the doors. As soon as the first movement to close the doors is made on the bridge, warning gongs begin ringing at every door. These ring five seconds to give notice to the engineering force below. Then the great, half-ton steel doors begin descending, dividing the ship into sections and forming partitions through which water cannot pass.

What the wireless telegraph can do in ensuring the safety of travel by sea is too fresh in the minds of the public to need reiteration. Another resource of mariners which does not possess the spectular features of the wireless, but is of almost equal importance in navigation, is the submarine signalling apparatus. Attached to the outside of the vessel are two small box-like affairs, resembling the early receivers on the telephone. They work on the well known principle of the sound-carrying qualities of water. From these two little boxes insulated wires run to the wheel house, terminating, after passing through a dial. in a telephone earpiece. On the dial are the words "port" and "starboard." In the box is a bell, sounded automatically. The fog stations, lightships, etc. are equipped with similar bells, and these may be heard through the apparatus for a distance of miles. The churning of a vessel's screw may be heard for three or four miles. When at anchor, the washing of the waves against the hull, or the occasional jolt of a bit of driftwood against the hull, may be plainly heard. If the sounds come from the port side they can only be heard when the switch of the dial is turned to "port" and vice versa. This apparatus is an invaluable aid to those who cross the trackless wastes of water.

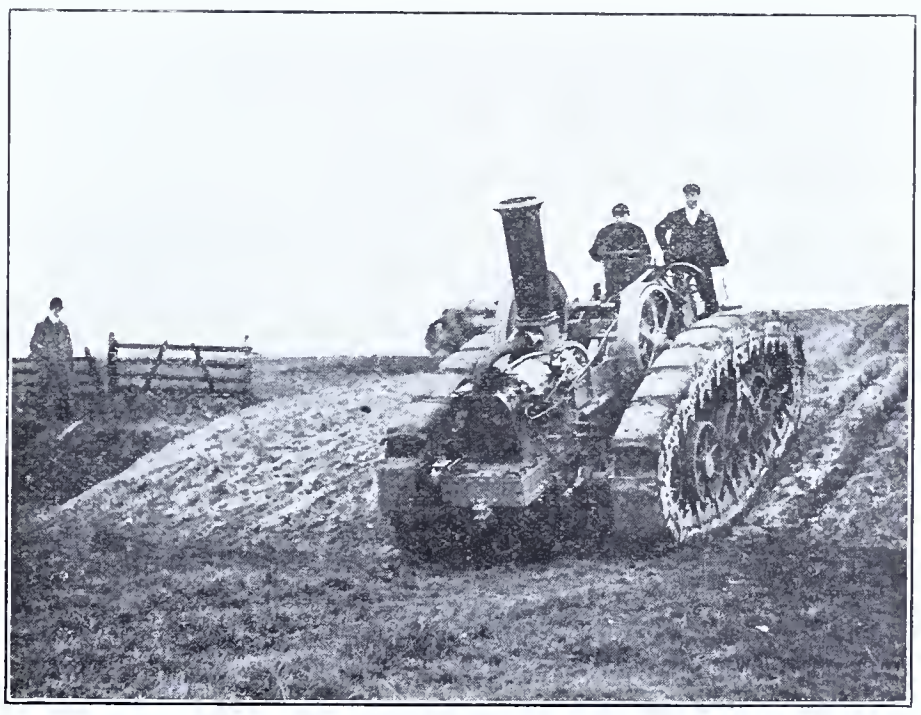
A WALKING ENGINE.

By C. VANLANGENDONCK.

A remarkable device known as the chain track tractor, has been recently tried with success in England. Although designed primarily for drawing war material and heavy guns over a trackless country, the engine promises to be useful in the transport of mineral and agricultural produce in many parts of the world. It is essentially an internal combustion oil traction engine, in which the driving and steering wheels are reinforced by endless belts, one on either side. Each of these belts is studded with broad interlocking feet, which present a solid resting surface for the weight of the engine. Unlike the ordinary engine, the chain track tractor is not dependent upon large quantities of coal and water while working. It is equipped with a double-cylinder internal combustion oil engine, in which oil takes the place of seven times its weight of coal, and only a few gallons of water are required for cooling purposes.



TRACTOR ABOUT TO DESCEND SAND HILL.



TRACTOR DESCENDING SAND HILL.

The tractor was first tested in a large field sloping towards a river. The lower portion of the field consisted of a soft clay bank and a considerable area of marshy ground. Soft sand banks were prepared in several places, and ditches were dug. Two engines were used at these trials. One was a 20 horsepower tractor fitted with chain tracks, and the second was a 35 to 40 horsepower motor car, drawing a trailer.

In the opening trials, the tractor ran down the slope to the marsh, the surface of which was so soft that in places a ten foot iron rod could be thrust down without finding bottom. Across this morass in the direction of the steep slope of the clay bank the car passed without difficulty, the water dripping from its chain tracks as it went, and plainly indicating the treacherous nature of the surface. Approaching the bank, the car began to climb the incline of one in two with as much steadiness as it had shown in crossing the swamp. Without visible effort the tracks revolved, covering foot after foot of the slope and carrying the heavy car, weighing 3 tons 15 cwt. Arriving at the top it seemed to hesitate for a moment, poised in mid-air, then coming gently down upon the level proceeded rapidly over the soft clay surface of the dump.

The next trial was undertaken with the addition of the trailer, weighing five tons, and proved the immeasureable superiority to ordinary traction of the new method, in dealing with swampy ground.

Demonstrations of ditch-crossing followed this exhibition. In these the car showed the value of the extended tread afforded by the long chain tracks. Instead of dipping into the ditch as an ordinary wheeled vehicle would have done, the car kept its level until half of its weight was over the gap, when its track met the opposite bank and continued until the whole of the car and its following burden had traversed the ditch. It was just as though a plank had been pushed over the dyke, upon which the car could safely travel.

The heavy oil tractor was then brought into use. A powerful steam tractor was urged across the soft clay surface of the made ground. At first it made some progress, but meeting a softer place it speedily sank into the sticky material. The traction driver did his best, but the great wheels revolved uselessly. At this moment the chain tractor, despite its equal weight and drawing capacity, walked past without the slightest difficulty, afterwards actually pulling its rival out of the hole into which it had sunk. To prove its ditch-stepping qualities the heavy tractor followed this demonstration of superiority by walking over a water-filled gap 4½ feet wide.

Sand is one of the most difficult obstacles encountered by tractors. To demonstrate the superiority of the device in such circumstances the chain car and its trailer were called into use. Approaching an artificial bank of freshly laid soft sand several feet in thickness, the car ran nine yards across it on the level, then walked down a slope at an angle of one in three, across a second level and down a second slope. finishing on the grass field, up which it proceeded as if it had not performed a feat unequaled in the history of heavy locomotion.

In all the trials the most noticeable feature was the ease with which the chain track car, trailer and engine, performed their work. Whether passing over morass, soft clay, sand, or grass, the machinery appeared to be naturally adapted to the difficult nature of the soil.

Medical Treatment by Wireless.

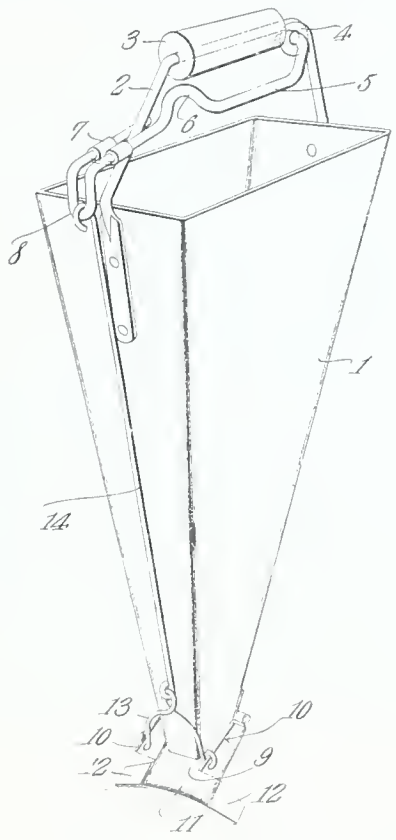
The latest achievement in wireless is reported from off the coast of South Carolina, some weeks ago, when a sailor fell from the rigging of a vessel and was injured. No one on board knew what to do; but through the medium of the wireless apparatus, communication was effected with a shore station, and then with a doctor, who gave directions as to the treatment. These were followed, the man improved, and the ship proceeded on her course. The next will probably be the sending of medicines by wireless.

CLEVER NEW PATENTS.

Hand Fertilizer Dropper.—Massage Instrument.—Rotary Engine.

Hand Fertilizer Dropper.

Truck farmers will appreciate a device for distributing fertilizer by hand so as to exactly regulate the quantity. Such an apparatus has been lately patented by J. T. Flippen, of Greystone, Va., and it consists of an elongated bucket with a swinging valve pivoted at its lower end, and a lever fulcrumed to the bail handle of the bucket and connected with the

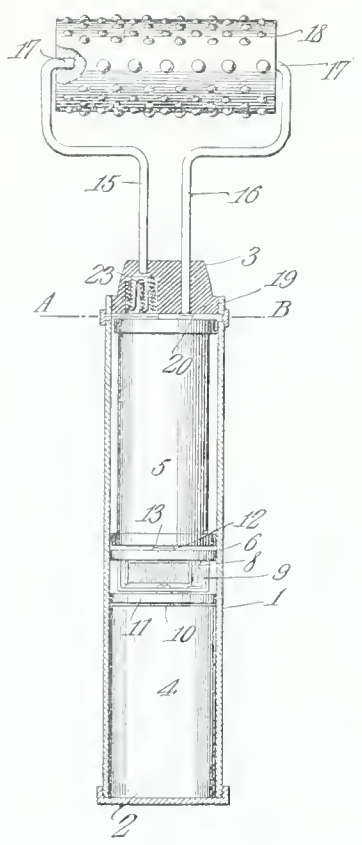


valve. Means is provided for limiting or regulating the swing of the lever and the corresponding movement of the valve. The latter is of such form as to permit a stream of fertilizer to flow from the lower end of the bucket, and it may be swung for the purpose of preventing the said material from choking in the end of the bucket. At the same time, the valve is provided with an extended lip having downwardly inclined side portions, adapted to separate the fertilizer as it is deposited on the ground. As will be seen in the cut, the bail handle 2 is attached to the bucket 1 and a loop 4 is bent in toward the bail 5 at a point beyond one of the ends of the grip 3. The end of the free end portion of the lever 5 is bent back, substantially parallel with the part of the lever which lies transversely across the bail 2, and the stop 7 is adjustably mounted on the parallel portions of the lever 5. That part of the lever which lies beyond the stop 4 is curved downward at 8. The valve 9 is hinged to the lower end of the bucket and is preferably made of metal, the body portion being adapted to close against the lower edge of the bucket. The valve has upstanding flanges 10. adapted to overlap the sides of the bucket, and is also provided with a lip 11, with a downwardly inclined section 12. The lower ends of the yoke 13 are pivoted to the flanges of the valve, and the rod 14 is pivoted to the lever 5 and to the yoke 13. When the bucket is filled with fertilizer, the operator swings the lever 5 at intervals. This moves the valve 9 and prevents the interior from packing at the lower end of the bucket. The stop 7 regulates the swing of the valve. If it is desired to retain the fertilizer in the bucket, the operator may pass a finger under the lever 5 and swing it toward the handle grip, which closes the valve and checks the flow. When the valve is open, the fertilizer passes from the bucket out over the lip 11, and as it moves along the sections 12, it is spread over the soil. The flanges 10 will prevent it from being blown laterally from the upper surface of the valve, and direct it toward the lip 11.

Massage Instrument.

Osteopathy, electric treatments and massage of various kinds are growing in popular favor as an auxiliary to therapeutics, and the little instrument pictured herewith, invented by John W. Scott and Daniel Tibbals, of Granite City, Ill., is the latest device in this line. The object is, in addition to the usual massage, to subject the skin to a high tension electric current. For this purpose the roller carried by the apparatus is made to constitute one terminal of an electric circuit, while the handle of the apparatus constitutes the other, so that the patient is included between the terminals and receives the benefit of the electric current passing through the body and through the parts subjected to the pressure of the roller.

To produce the current, the handle of the apparatus is provided with an induction coil and a battery; there is also a vibrating circuit maker and breaker or rheotome, and in order that the intensity of the current may be varied and at the same time the electricity conserved, there is included

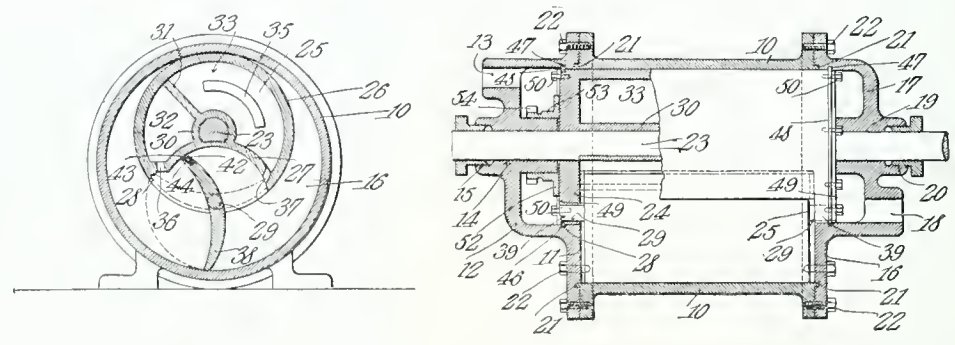


a suitable rheostat. This is in the primary circuit of the induction coil, and is made readily accessible from without the machine, so that it may be adjusted at will.

A cylindrical casing, 1, constitutes the handle of the implement, and has a screw cap at one end and an insulating block 3, at the other. Within the handle is a dry battery cell 4, an induction coil 5, and a rheotome 6. The outer shell of the cell forms one of the elements of the battery and also a battery terminal, so that when slipped into the casing, electric contact is made between the outer shell and the inner face of the casing. The other terminal of the battery makes contact with the terminal 11 of the rheotome. The other rheotome terminal 12 contacts with the terminal 13 of the winding 14 of the induction coil 5. Fast in the block 3 are two stems 15 and 16, made of spring metal so that the fingers 17 may be removed when desired from the roller 18. The stem 16 terminates on the inner end in a head 19, arranged to make contact with a circuit terminal 20 of the winding 21, the other end of which contacts with the handle 1. Within the insulating block are resistance coils 23, each of which terminates in a contact plate, and in line with these plates is a blind contact. Contiguous with the inner face of the block the handle casing is pierced by two diametrically opposed slots, closed on their outer faces by a ring held in place by a screw entering one of the slots, and by a switch-arm passing through the other and in position to make contact with the terminals. This ring is turned on the handle as a center to bring the switch arm into contact with any of the terminals. There is a suitable scale to show the amount of resistance in circuit, and also if the circuit is open. The series of resistance coils terminates in a circuit terminal in the path of a contact at the end of the coarse winding of the induction coil 5. When desired, the circuit may be broken and the instrument may be used for simple massage, by passing the roller over the skin without the effect of the electric current.

Rotary Engine.

A device which stands conspicuously above its class on account of the novel features involved, is a rotary engine for which credit is due to Frederick W. Remer, of Lawton, Oklahoma. One of its special objects is the provision of an improved valve gear and cut off, and also a new form of rotor. Generally speaking, it consists of a cylindrical casing having at one end a steam chest and at the other an exhaust chest, an improved form of valve held in the steam chest, a rotor mounted within the cylindrical portion of the casing and eccentric thereto, and an impeller blade pivotally mounted on the rotor. As seen in the drawing, 10 indicates the cylindrical casing, one of whose heads is attached to the steam chest 12, and the other to the exhaust chest 17. Both



chests are provided with bearings and stuffing boxes, and the bearings support a shaft 23, which has a rotor firmly secured thereto. The heads of the rotor fit closely within the openings of the steam and exhaust chests, and between these heads is an outer wall which forms substantially a longitudinal trough, one edge of which is cut away at 28. The trough, 27, is so proportioned that a bearing may be formed in each of the ends of the rotor, concentric to the arc of the trough. The rotor is internally divided into two chambers, of which 32 is a steam and 33 an exhaust chamber, connected by ports with the respective chests. To actuate the rotor, there is provided a crescentic impeller blade, pivoted in the recess between the ports and adapted to alternately house in the recess and be projected therefrom, the port connecting the recess with the exhaust chamber of the rotor being controlled by said blade. The rotor has a longitudinal recess provided with ports communicating respectively with the steam and the exhaust chambers. On the bearing 14 is an eccentric portion on which is mounted a cut off plate 52, in the form of a one-step cam, so proportioned as to permit the port 34 to open and close alternately as the rotor moves around. From the plate extends a sleeve 53, which through gear and pinion connects with a shaft which projects through the steam chest and has on its outer end a handle 59, which causes the valve plate to rotate about the eccentric portion of the bearing and opens or closes the port. When the steam is turned on, it passes through the port into the chamber 32, presses against the impeller blade, and rotates the rotor. Since the portion of the blade bearing on the inner periphery of the casing is greater than the portion within the trough, the blade will be at all times forced flatly against the periphery of the casing. Dotted lines in the cut show the position the blade assumes when the journals are at the top of the figure. As the blade passes this point the pressure forces the portion of said blade of greater area outward, and causes it to assume positions varying from that of the dotted lines to the full lines. Meanwhile the steam held in the space to the right of that figure escapes. If at any time it is desired to change the cut off, it is simply necessary to move the handle in the proper direction, and the cut off may be changed without interfering with the main steam supply.

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LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

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TUBELT CO. v. FRIEDMAN et al.

(Circuit Court, D. New York. January 8, 1908. 158 F. R. p. 430.)

1. PATENTS—INVENTION—SUBSTITUTION OF EQUIVALENTS IN OLD STRUCTURE.

Patentable invention is lacking in a structure all of the elements of which are found in the prior art, and where all the alleged inventor does to produce it is to take one of the prior patented devices and substitute for one of its elements a well-known equivalent taken from another device of the same kind, where it was used for the same purpose, operated in the same way and produced the same results, and the only result of the substitution is that the operation of the structure is somewhat improved.

2. SAME—LARGE USE AS EVIDENCE OF INVENTION.

A valid patent must combine utility, novelty, and invention, and neither large sales nor popularity nor effectiveness of itself shows patentable invention, nor do all together.

3. SAME—WAIST BELT.

The Gaisman patent, No. 661,447, claim 6, for a waist belt made of a single piece of material doubled or folded lougitudinally, and having the edges sewed together by means of a loop or zigzag stitch which will permit the material to be flattened out so that the edges will abut and lie in the same plane, leaving the surface smooth, is void for lack of patentable invention; the only difference between the structure shown and others in the prior art being in the character of the stitch used, which was also old and had long been used for similar purposes where an elastic seam was desired.

BENJAMIN MOORE & CO. v. AUWELL.

(Circuit Court, E. D. New York. January 8, 1908. 158 F. R. p. 462.)

TRADE-MARKS AND TRADE-NAMES — INFRINGEMENT-PRELIMINARY INJUNCTION.

Where, in a suit to restrain defendant from using the name "Muresco" to indicate a wall finishing product sold in competition with complainant's product, called "Murafresco," defendant submitted affidavits claiming a prior use of defendant's word in the trade for a similar product and a general use of combinations of the stem of the Latin word "murus" with various terminations, no adjudication having been had in favor of complainant, a preliminary injunction would be denied under the rule that such a writ will not be granted except when the papers present a clear case.

RUSHMORE v. SAXON.

(Circuit Court, S. D. New York. Jan. 4, 1908. 158 F. R. p. 499.)

1. TRADE-MARKS AND TRADE-NAMES—UNFAIR COMPETITION—FRAUDULENT IMITATION IN FORM OF ARTICLE.

Complainant was a manufacturer of search light lamps for automobiles, known generally by his name as the "Rushmore" lamps. He also designed a new and distinctive ornamental shell to distinguish his lamps from those of other makers, such peculiar design being nonfunctional. Defendant, who was also a maker of lamps, copied complainant's shell in all particulars even to defects, although, as shown, the shape of such shell rendered his own lamps less effective for use, the result being that in appearance there was nothing to distinguish his lamps from those of complainant except the reading matter on a small and inconspicuous name plate which was also needlessly put in the same place on the shell as that of complainant. Defendant also sold and billed his lamps to purchasers as "Rnshmore" lamps. His lamps were however lighter and inferior material and cheaper construction and could be and were sold at a smaller price than complainants. Held, that he was chargeable with unfair competition, and that complainant was entitled to an injunction to restrain the same; the imitation being clearly by design, and for the purpose of misleading purchasers to complainant's injury and defeudant's advantage.

2. SAME—TRADE-NAME — ARBITRARY COMBINATION OF WORDS.

When one has designedly and arbitrarily taken an unusual and ungrammatical combination of two words, even if they do suggest an idea, and a correct one, of the construction or utility of the article of manufacture, and by long use it has come to be understood by the purchasers and users thereof, a competitor has no right to use it for the purposes of deceit.

3. SAME — INFRINGEMENT — DECEPTION OF PUBLIC.

Where complainant arbitrarily selected the name "Flare Front," and used it to designate and distinguish an automobile lamp made by him from all others for so long a time that it became associated by purchasers with his lamps, defendant had no right to appropriate and use such name to aid him in palming off on purchasers as complainant's, lamps of his own make which were in appearance exact duplicates of complainaut's lamps, and such use by him will be enjoined.

DR. A. REED CUSHION SHOE CO., Limited v. FREW et al.

(Circuit Court, W. D. New York. Jan. 6, 1908. On Settlement of Decree, February 14, 1908. 158 F. R. p. 552.)

1. TRADE-MARKS AND TRADE-NAMES-RIGHT TO PROTECTION—NAME OF PERSON.

A prior right to a trade-name under which a business is conducted and good will established, even if it be the name of an individual, will be protected against another of the same name who uses it to pass off a fraudulent imitation as the goods of the one first acquiring a right to its use.

2. SAME—UNFAIR COMPETITION.

One Adam Reed invented and patented a cushion sole for shoes, and the pateuts and a registered trade-mark of a cushion shoe in connection with the name "Dr. A. Reed's" were assigned to complainant, which established a number of stores for the sale of such shoes, expended large sums in advertising and building up a trade in the same under such name. Subsequently, Reed obtained other patents for cushion soles, under which defendant corporation, of which he became president, began to make shoes, which it sold, using upon its cards, labels, shoe straps, and advertisements the words "Dr. A. Reed, Patentee," also printing upon its labels and boxes notices that such shoes were not the "Dr. Reed Cushion Shoe" made under former patents, but were covered by later improved patents. It was shown that complainant's shoes were ordinarily known and distinguished by retail purchasers merely as the "Dr. Reed" shoe. Held, that defeudant, by using such name, was chargeable with unfair competition and a fraudulent invasion of complaiuant's prior acquired rights, there being no business reason for such use unless to obtain the advantage of the reputation of complainant's shoe by confusing or misleading purchasers.

3. SAME — INFRINGEMENT — RIGHT TO ACCOUNTING FOR PROFITS.

A defendant will not be required to account for the gains and profits made by an unfair competition where, under a prior decision between the parties, it was justified in believing that with certain changes, which it made, it would not be chargeable with an unlawful invasion of complainant's rights, nor where there is grave doubt whether such proof could be made as to entitle complainant to a substantiated recovery.

ELECTRIC STORAGE BATTERY CO. v. GOULD STORAGE BATTERY CO.

(Circuit Court of Appeals, Second Circuit. Aug. 24, 1907. 158 F. R. p. 610.)

1. PATENTS — SCOPE — CONSTRUCTION OF CLAIMS.

While a patentee is entitled to all the beneficial uses of his invention, when the property or function is inherent in the invention or is described or claimed by him, yet where such change or function is neither described or claimed, and especially where other changes are described and insisted on as essential and especifically claimed, it is significant proof that the change which has not been disclosed by him to the public is not his invention.

2. SAME—INFRINGEMENT — ELECTRIC CURRENT REGULATOR.

The Mailloux patent, No. 430,868, for a regulating system for electric circuits, construed, and held valid, as disclosing a patentable improvement on the devices of the prior art, but, as limited by its terms, not infringed.

BENJAMIN ELECTRIC MFG. CO. v. DALE CO. et al.

(Circuit Court of Appeals, Second Circuit. Nov. 13, 1907. 158 F. R. p. 617.)

1. PATENTS—ANTICIPATION—PRIORITY BETWEEN PATENTS TO SAME INVENTOR.

To the general rule that of two patents granted to the same inventor the one first numbered takes precedence of the other, there is an exception where the patentee had an application pending for the second when the first was issued, and especially where the two are the result of the splitting of the same original application by the Patent Office, in which case neither can be held an anticipation of the other, but they may be treated as a single patent.

2. SAME—INFRINGEMENT—CLUSTER LIGHTS.

The Benjamin patents, Nos. 721,774 and 721,777, granted on a divisional application, and both relating to a cluster of electric lights, disclose invention and are valid. Claim 32 of the former and claims 5 and 13 of the latter, however, are void, as too broad and covering other than the "wireless cluster" of lamp sockets, which is the essential feature of the inveution. Claims 5 and 7 of No. 721,774 also held infringed.

3. SAME.

That one structure may be a patentable improvement on another will not relieve it from infringement of a patent for the latter, where it contains a specific device covered by such patent.

JAMES SPEAR STOVE & HEATING CO. v. KELSEY HEATING CO.

(Circuit Court of Appeals, Third Circuit. Jan. 7, 1908. 158 F. R. p. 622.)

PATENTS—INVENTION—HOT AIR FURNACE.

The Kelsey patent No. 476,230, for a hot air furnace, claim 5, is void for lack of patentable invention as covering merely an aggregation of old elements, each performing its old function independently of the others and producing no new result, although their aggregation in the same structure may produce an improved result.

LORAIN STEEL CO. v. PAIGE IRON WORKS et al.

(Circuit Court, N. D. Illinois, E. D. Jan. 24, 1908. 158 F. R. p. 637.)

PATENTS — INFRINGEMENT — RAILWAY SWITCHES.

The Kress patent No. 633,723 and the Krauss patent No. 555,171, both for improvements in railway switches of the tongue type, most generally used on street railways, and each for means for preventing the kicking of the switch, if conceded validity, are each limited by the prior art to a very narrow scope, and closely to the devices shown and described. As so construed, held not infringed.

GREENE TWEED & CO. v. MANUFACTURERS' BELT HOOK CO.

(Circuit Court, N. D. Illinois, E. D. June 1, 1906. 158 F. R. p. 640.)

1. TRADE-MARKS AND TRADE-NAMES—UNFAIR COMPETITION.

The name of a patentee of an article of a new and original type, by which such type becomes known or distinguished in the trade, after the expiration of the patent may lawfully be used by any maker or dealer to designate articles of that type, and such use is not within the rule of unfair competition.

2. SAME—MARKING OF PATENTED ARTICLE-EXPIRATION OF PATENT.

An arbitrary symbol or device stamped by the manufacturer only on articles made under certain patents, on the expiration of such patents becomes public property, and its use by others does not constitute unfair competition.

3. SAME—DESCRIPTIVE NAME—"STUD."

The word "stud," used to designate a belt fastener which is in fact a stud, is descriptive merely, and cannot be exclusively appropriated by a single manufacturer.

AMERICAN TIN PLATE CO. v. LICKING ROLLER MILL CO.

(Circuit Court, E. D. Kentucky. April 1, 1902. 158 F. R. p. 690.)

1. TRADE-MARKS AND TRADE-NAMES—"INFRINGEMENT" — COPYING ESSENTIAL FEATURE OF TRADE-MARK.

About 1840 a firm in Wales adopted as a trade-mark for terneplate manufactured by it, by a secret process, the letters of "M. F." in monogram inclosed within a circle. They subsequently granted a license to use the process and trade-mark to a manufacturer in the United States, which was afterward acquired by complainant, and the trade-mark was registered in this country. The plate so made was specified by architects, and ordered and designated by dealers as "M. F." terneplate. Held that, while the letters were used by the proprietors on their goods only in monogram inclosed within a circle, which constituted the technical trade-mark, they were its essential feature, and that any use of such letters by another to designate a different plate, either alone or in connection with other letters or words constituting a different dress, was an infringement, and clearly so where such use was calculated or likely to deceive purchasers or users.

2. SAME.

Where, by use of a trade-mark, the goods of a manufacturer have come to be known by a particular name, the adoption of a rival manufacturer of any mark or device which causes his goods to become known in the market by the same name may be an infringement on the trade-mark.

3. SAME — EVIDENCE TO ESTABLISH INFRINGEMENT.

To establish infringement of a trade-mark, it is not essential to show that any one has actually been deceived, or an intent to deceive, although proof that persons have been deceived is pertinent and persuasive evidence that the mark complained of is calculated and was intended to deceive.

THOMSON-HOUSTON ELECTRIC CO. v. WESTERN ELECTRIC CO.

(Circuit Court of Appeals, Second Circuit. Dec. 4, 1907. 158 F. R. p. 813.)

1. PATENTS-VALIDITY OF REISSUE-LACHES.

The question whether two patents are for the same invention is one of law, to be determined by a comparison of the documents themselves, no extrinsic evidence being necessary, and hence the decision of a Circuit Court of Appeals holding the later patent void for double patentiug, although rendered on an appeal from the interlocutory order grantiug a preliminary injunction, is in effect a final decision for the purpose of advising the owner of the invalidity of the pateut, and any delay thereafter in applying for a reissue for the purpose of curing such invalidity is at his peril.

2. SAME.

The owner of a patent which has been declared void by the decision of a Circuit Court of Appeals cannot thereafter continue litigation thereon for years in other circuits, and, if finally defeated, then apply for and obtain a valid reissue.

3. SAME.

The Van Depoele reissue patent No. 11,872 (Original No. 495,443), for a traveling contact for electric railways, is void for latches in applying for the reissue.

UNITED STATES HOG-HOISTING MACH. CO. v. NORTH PACKING & PROVISION CO.

(Circuit Court of Appeals, First Circuit. January 14, 1908. 158 F. R. p. 818.)

PATENTS — INFRINGEMENT — HOG-HOISTING MACHINE.

The Mahoney patent No. 441,311 for a hog-hoisting machine, if conceded valid, is for an invention of minor character relating to a combination of mechanical details, and is entitled to but a narrow range of equivalents; and, so construed, held not infringed.

NEW YORK BELTING & PACKING CO. Limited, et al. v. SIERER et al.

(Circuit Court of Appeal, Second Circuit. Jan. 7, 1908. 158 F. R. p. 819.)

PATENTS— INVENTION — TILE FLOORS AND WALLS.

The Furness patent No. 525,961 for a tile floor or wall composed of tiles of yielding material with interlocking joints is void for lack of invention in view of the prior art which showed interlocking wall tiles of non-yielding materia and floor tiles of rubber not interlocking.

MECHANICAL INVENTIONS AND DESIGNS.

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Lucas A. Grimsrud, Spokane. Wasb. Hose Reel.—An object of the present invention is to provide for garden hose a reel adapted to permit hose to be quickly and easily handled, and capable of effectually preventing the same from kinking and of enabling the hose to drain after it has been wound on the reel.

John J. Newbaker, Steelton, Pa. Brake Shoe.—The object of the present invention is to enable metallic brake shoes for railway cars to be manufactured more rapidly and at less expense than heretofore, and without impairing the strength and efficiency of the brake shoes. It consists of providing the body portion of the shoe with corrugated rear faces, and forming projecting tongues which are spaced apart to provide an intervening recess.

Fred N. Scofield, Kern, Cal. Oil Well Cleaner.—An object of the invention is to provide a well cleaner, designed for use in oil fields wbere oil is obtained from strata of oil sand, and where it is customary to line tbe wells with the casing and to perforate the casing at the points where the strata of oil and sand lie, or line the well from top to bottom with perforated casing, and adapted to enable the oil to be pumped into a well, and the pressure applied to, and confined at, any portion of the well casing, so that the perforations at any one of the strata of oil sand may be easily cleaned.

Abram L. Foote, Fayette, Iowa. Disk Land Cultivator, Harrow, Road Machine and Farm Wagon.—An object of the present invention is to provide a machine capable of cultivating and sowing land and of smoothing and repairing the surfaces of roads, and adapted also for use as a farm wagon or hay or stock rack by removing the mechanism from the main frame and placing thereon a wagon body, hay frame or the like. Another object of the invention is to enable either a gang of disks or a scraper to be hung from the main frame in an oblique or diagonal position, or a harrow to be suspended from the frame with its side bars in parallelism with the median line of the machine. It is also an object of the invention to provide a running gear, which will permit either of the front wheels to drop into a rut or hole without straining the frame or affecting the horizontality of the same.

William H. Hardman, Edison, Ohio. Fender Attachment for Cultivators.—An object of this invention is to provide for straddle row cultivators a fender, designed particularly for use in covering grass in fields where the young plants under cultivation vary in size, and adapted to be readily lowered to the ground to prevent the cultivator from covering small plants, and capable of being lifted clear of the ground when the plants are of a height which do not require such protection.

Robert J. Livengood, Harvel, Ill. Concrete Base for Fence Posts.—It is the aim of the present invention to provide for wooden fence posts a concrete base, adapted to be applied to the posts both in the construction of fences and in repair work, and capable of effectually preventing a wooden fence post from prematurely rotting or decaying at the bottom where it is attached to the base. Another object of the invention is to provide a concrete base, equipped with means for providing intervening air spaces between it and the post to cause the latter to dry readily and prevent accumulation of moisture.

Jennings Van Matre, Creston, Cal. Draft Equalizer.—This invention relates to improvements in draft equalizers, particularly intended for harvesters and other agricultural implements, though, of course, not necessarily limited to such uses. The particular object of the invention is to provide a very simple structure of a novel nature that may be made to employ any number of horses or other draft animals, and it is so arranged that each animal must do its quota of work, and cannot shirk at the expense of others, while the faster animals will be retarded to approximately the ratio of work of the others.

George S. Whittaker, Gloversville, New York. Suction Device for Dental Plates.—One of the great difficulties experienced witb the suction devices now in general use is that they are permanently fastened in place, and therefore if tbe plate has to be softened and re-vulcanized, the yielding suction device becomes so hard that the suction is ruined and the device is therefore useless. One of the objects of the present invention is to provide novel means of a yielding character that will constitute a secure holding device, and can be readily detached if it is desired to reform the plate, so that it will not be injured by re-vulcanization. A further and important object is to provide a novel device that will have a double suction, thereby being more effectually held in place.

George Dumas, Walhalla, North Dakota, Envelope.—This invention relates to improvements in envelopes, and more particularly to that type known as safety envelopes. The invention has for one of its objects to provide an envelope having means for immediately detecting surreptitious opening thereof. A further object is to provide means for facilitating the unsealing and opening thereof for the purpose of removing its contents. The invention comprises a body portion, a flap secured thereto and provided with a guideway longitudinally thereof, and a fastenting means having one end secured to the body portion at one end thereof, then passing through the guideway of the flap to the other end of the envelope, and then over the face of the envelope where it is sealed.

John A. McCoy, Kennett, Cal. Collapsible Lantern.—This invention relates to collapsible lanterns, and has for its object to provide a novel and exceedingly simple article that can be compactly folded when not in use so that it can be conveniently carried in the pocket; can be readily set up, is composed of a few simple parts so that it can be cheaply manufactured, and has no elements that are fragile and liable to become broken.

Emmet D. Barnes, Traverse City, Mich. Radiator Vent Attachment.—This invention relates more particularly to means for permitting the escape of air from the radiator when steam is turned into the same, and has for one of its objects to provide novel means of a simple nature that is readily applicable to any well-known type of radiator, said means permitting the free escape of air from, and preventing its ingress into, the radiator when a partial vacuum is formed therein. Another object is to provide muffling means which permit the escape of air without noise, and, furthermore, to provide an attachment which may be applied to an ordinary vent, said attachment having means whereby the valve mechanism of such vent may be conveniently adjusted without the necessity of removing the attachment.

Hugh R. Tooker, Oil Center, Cal. Emergency Engine Stop Mechanism.—The constant presence of an engineer at an engine is frequently impracticable, and, therefore, it is often the custom to permit an engine to run for a considerable period without supervision. It sometimes happens therefore that the breakage of a blade, the variation of the load or some other occurence of a similar nature frees the engine so as to permit it to race and thereby injure itself. The principal object of this invention is to provide novel means of a simple nature which will automatically cut off the supply of motive fluid to an engine, and thereby stop the same, whenever its speed becomes excessive from any cause.

Emery A. Voight, Paducah, Ky. Steam Boiler.—This invention relates to rotary steam boilers, and the principal object is to provide a novel and entirely practicable structure of this character, wherein the full effects of the heat are secured, proper draft is insured, and, at the same time, the flues are kept clean. The region around the furnace doors is entirely free from obstructions, the usual and necessary water level gaging mechanism can be employed, and simple means is provided for blowing off the scum and refuse from the interior of the boiler.

William E. Gray, Roanoke, Va., inventor; John B. Beard, Roanoke, Va., assignee of one-half interest. Air Compressing Apparatus.—This invention relates to an air compressing apparatus, the object being to produce a simple, durable and efficient apparatus of this character organized in such a manner to permit the parts to be readily disorganized for transportation from one point to another, and capable of being assembled or set up with facility and dispatch and without necessity for the employment of skilled labor. Another object is to provide an arrangement of air pumps or compressing units driven by operating means common thereto, and discharging continuously into the reservoir from which the air is led to the point of use. A further object is to organize the several pumps and their connections in a rigid structure capable of being detached as a unit from the remaining elements of the apparatus, to facilitate cleaning or repair without disturbing the adjustment or mounting of the remaining portion of the structure.

John P. Mern, Brooklyn, N. Y., inventor; C. H. Bull, New York City, assignee of one-half interest. Pipe Testing Mechanism.—This invention relates to means for testing water and steam pipes by internal pressure, and has more particular reference to the means for closing the ends of the pipes. The object of the invention is to provide a simple and novel structure that is exceedingly strong; that withstands the force exerted thereagainst; can be applied to, and removed from, pipes of different shapes and character with ease and expedition, and when in place will engage the pipe in a manner that will eliminate the danger of the closure being forced from its proper and operative position.

John P. Mern, Brooklyn, New York. Valve Mechanism.—This invention while relating more particularly to valve seat structures of hydrants, is not necessarily limited thereto, but may be advantageously employed in analogous apparatus wherein valves are used. The principal object of the invention is to provide a novel and simple valve seat that can be placed in position and removed so that if the valve mechanism becomes worn or deranged, access thereto may be readily gained and the injured parts repaired or replaced with ease and expedition. Means are also provided whereby the valve seat may be effectively fastened in the casing, said means also preventing leakage through the joint between the seat member and the casing.

David B. Anderson, Lock Haven, Pa. Target Trap Controlling Means.—This invention relates to mechanism for manually effecting or controlling the movements of different parts of target traps. Heretofore certain parts or movements of traps of this character have been controlled by hand. In some the target carrying or projecting arm is manually drawn back, and in others the latch is hand-controlled to release such arm, and also manually-actuating means is provided in others for feeding targets to the carrying mechanism. The principal object of the invention is to provide a novel, convenient and exceedingly simple means for effecting the movement of such trap-actuating device, said means being clearly applicable to the different types of traps and devices, and being readily adjustable to the different conditions of use.

Charles T. McCarroll, Ottumwa, Iowa. Cream Separator.—This invention relates to that class of separators employing a cooling fluid that is kept separate from the milk, though portions of the structure can be employed for cream separation wherein the water is mixed with the milk. The principal object is to provide a separator wherein an equable temperature can be maintained and sudden changes entirely obviated. Means is also provided whereby the temperature may be varied at will to suit the condition of the outside temperature. Another object is to provide a structure which may be readily and thoroughly cleansed, and is easily handled.

Charles T. McCarroll, Ottumwa, Iowa. Coal Stove.—An object of the present invention is to provide an air tight coal stove of increased heating capacity, constructed to operate as a base heater without employing the usual bottom flues for effecting this result, and adapted to accommodate an ash pan of greater diameter than the grate, so that all the ashes shaken from the grate will fall into the ash pan.

Charles T. McCarroll, Ottumwa, Iowa. Stove Pipe Thimble.—This invention has for its object to produce a stove pipe thimble, adapted to prevent soot from blowing into a room, and capable also of preventing a stove pipe from being pushed too far into a stove pipe hole, and thereby interfering with the draft through a chimney or flue. Another object of the invention is to provide a stove pipe thimble, equipped with means for positively engaging and clamping either end of a stove pipe, and adapted to be compactly nested on the shelves of a store or for shipment.

Charles T. McCarroll, Ottumwa, Iowa. Stump Burner.—It is the aim of the present invention to provide a stump burner, adapted to be placed over a stump and capable of effectively burning both dry and green stumps, and also the roots thereof for a distance of several feet beneath the surface of the soil, in order to clear the land and prevent the roots from interferring with the plow, or other cultivating device. Another object of the invention is to equip the stump burner with means for directing a blast of air upon a stump and upon the larger roots in order to more quickly and completely consume the same.

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FOR SALE — Patent No. 884,599. Improved Stanchion Latch. This is a drop or gravity latch. The best stanchion latch known. Indispensable when once the farmer or dairyman has tried it. Address, D. E. Miles, Box 597, Fredonia, Kansas. jy

FOR SALE — Patent No. 906,635. Street-Car-Brake. Works by foot lever. Does away with hard-working crank. Want correspondence with honest men and manufacturers to place brake on the market. Would sell state rights. Address, J. G. Kerr, Ionia, Kansas. jy

FOR SALE—Patent No. 899,487, dated Sept. 22, 1908. Pick Ax Guard. A device that is much needed in rock work and coal mines. Invented by a blacksmith who knows what is needed. Saves the handle from wearing out. Address, W. Gordon. High Falls, New York. jy

FOR SALE—Patent No. 907,612, dated Dec. 22, 1908. Carpenter's Gages and Scribers. Cheap for cash. Address, A. Krehlik, 1909 Buckeye Road, Cleveland, Ohio. jun

FOR SALE—Patent No. 905,058, "Autosleigh." Money maker. Investigate. Address, C. Whitney Dennis, Euclid Ave., Hackensack, N. J. jun

FOR SALE—Valuable patent in medical line. Would trade or invest part in stock company. Price $10,000. Address, P. W. Shute, White Pigeon, Michigan. jun

FOR SALE—Patent No. 851,348. A patent gasoline generator torch for gasoline lamps that does away with the alcohol torch. Write C. T. Edward, Greensburg, Ind. jun

FOR SALE, or on royalty—Patent No. 902,997, issued Nov. 3, 1908. Sanitary Automatic Waterfountain for Poultry or Cattle. The fountain is closed against contamination, etc., until they come to drink, when it opens to let them drink, and when they leave it closes again. It can be operated while stationary. Address, Richard Partington, Barnesboro, Pa. jun

FOR SALE—Patent No. 898,685, issued Sept. 15, 1908, Keyless Door Lock. A substitute for lost keys and broken locks; fits any lock. It locks securely when everything else fails. No tools needed; no scratching of doors. Will sell outright or on royalty basis. Address, Simon N. Ritter, P. O. Box 323, Allentown, Pa. jun

FOR SALE—Patent No. 901,124, dated Oct. 13, 1908. Air agitating device for valve-bearing solutions, or any solution requiring constant agitation. For full particulars address, Thomas A. Ross, Selby, Contra Costa Co., Cal. nov 09

FOR SALE—Patent No. 902,746, dated Nov. 3, 1908. Self-Fastening Hook and Eye. Quickly attached. Looks much like the ordinary hook-and-eye. A certain success. Outright for $2000 or state rights. Address, H. N. Legan, 677 South Pennsylvania St., Denver, Colorado. jun

FOR SALE—U. S. Patent No. 864,792, issued Sept. 3, 1907. Meek Window Ventilator. Is attached at top of upper window sash and provides against down draft. The wind entering the room is directed to ceiling, and protects window curtain and shade. Is easily manipulated. Will sell at reasonable price. If interested, write for descriptive booklet and testimonials, A. S. Meek, Washington, Iowa. jun

FOR SALE—Newly patented nut lock washer. A perfect locking device. Great money maker. Write for free sample. Address, Frank Matoushek, Gregory, South Dakota. my

FOR SALE—U. S. Patent on a non-refillable bottle. No. 893,575, patented Sept. 15, 1908. For sale at reasonable price, or let on royalty. Send 10 cents to the publisher of "Inventive Age," (giving this patent number) for a copy of the patent giving full description of same, or write to me for particulars in the matter. Reuben R. Graves. R. F. D. No. 3, Box 35, Salem, Oregon. my

FOR SALE—Patent No. 883,624, dated March 31, 1908. Rock Digger, for clearing loose rock from farm lands, as well as for other purposes. Address, W. L. Combs, Bear Creek, Montana. jun

FOR SALE—Patent No. 907,493, issued Dec. 22, 1908. Sash Lock. A new device and good money maker. Like to sell outright for a reasonable price. Address, O. Gunther, P. O. B. 114, Kellogg, Idaho. jun

FOR SALE—Patent No 878,464 Hook and Eye. Can be ironed over or put through clothes wringer, as it is perfectly flat. Will double sale of other hook and eyes. Address, W. H. Knobloch, Erie, Pa. jun

FOR SALE — The Perfect Cistern, patented April 21, 1908. This is a useful invention and will sell well in county rights. Write for circular and particulars, H. H. Wise, Decatur, Ill. jun

FOR SALE—Patent No. 905,918, dated Dec. 8, 1908. Front Wheel Drive for Traction Engines. Address, John A. Peters, Plum Coulee, Manitoba, Canada. jun

FOR SALE—Patent No. 909,918, issued Jan. 5, 1909. An Electric Burglar Alarm which rings the alarm and shows the particular door or window being opened. Will sell outright or state and county rights. Address, John D. Wheeler, Salem, Oregon. jun

FOR SALE—Patent No. 901,325. $5,000 will secure an active or silent one-half interest in an up-to-date toy that will return investment on first year's sales. Will sell outright for $8,000. Act quickly. Address, William H. Davis, Federalsburg, Md. my

FOR SALE—Patent No. 899,675, dated Sept. 29, 1908. Attachment for ironing boards; an article that is wanted by every house wife; will sell outright at reasonable price; have not means to manufacture. Address, Joseph Michael, 446 North Railroad St., Pottsville, Pa. my

FOR SALE—Automatic Show Case. Can be made in several sizes. Adapted for fountain pens and jewelry especially. Convenient and simple. Will sell cheaply if taken at once. Address, L. Peters, Marinette, Wisc. my

FOR SALE—U. S. Patent No. 902,831, dated Nov. 3, 1908. Self-lubricating bushings for pulleys. Will sell outright. Write C. A. Petersen, P. O. Box 41, Laconia, N. H. my

FOR SALE—On account of poor health, my Friction Clutch Pulley, Patent No. 654,162, 1900, and Lamp Attachment No. 908,015, December, 29, 1908. Send for circular, Fred L. Kuhn, Fitchburg, Mass. my

FOR SALE—U. S. Patent No. 891,036. Self-Ejecting Penholder. Slight pressure on upper end ejects broken or damaged pen from holder. Address, Edward Browning, Boone, Iowa. my

FOR SALE—Patent No. 905,141, dated Dec. 1, 1908. Terminal Insulator. Simple, practical and easily manufactured. Correspondence solicited with manufacturers of electrical devices. Address, L. L. Bogue, East Orwell, Ohio. my

FOR SALE—Patent No. 903,822, dated Nov. 10, 1908. Hen's Nest. Will sell outright or by territory. A necessity for every farmer. Address, James Kirkham, Newton, Jasper County, Ill. my

FOR SALE — Patent No. 905,781. Improved Telephone Receiver. Address, Nathaniel Baldwin and Wm. Witt, Heber City, Utah. my

FOR SALE—Patent No. 817,190. Wire Stretcher and Splicer. Simple; easy to operate and manufacture, and what all wire fence owners want. Address, George W. Riker, Russell, Iowa. my

FOR SALE—U. S. Patent No. 876,033. Lantern Attachment. For elevating the lantern to different heights. A very useful device especially for farmers and mechanics. Address, L. D. Whiting, Milldale, Connecticut. my

FOR SALE—A patent machine for rowing a boat. Always in order. Safe for a child. One man can do the work of three men. Will dispense with oars. Address, Harvey T. Schweers, 524 Howard St., Petaluma, Cal. my

FOR SALE—U. S. Patent No. 873,893, issued Dec. 17, 1907. Canadian Patent No. 113,208, issued July 28, 1908. Improvements in Bag Holders. Will take the first reasonable offer. Address, Otto A. Pust, Holloway, Minn. my

FOR SALE—U. S. Patent 904,019, dated Nov. 17, 1908. Automatic Wire Stretcher. Works on new principle. Simple and effective. Desire to sell outright. A bargain if sold quickly. Address, Earnest F. Schuster, Geneva, Nebr. my

FOR SALE—U. S. Patent No. 906,351, dated Dec. 8, 1908. Planter used for planting almost every kind of seed at predetermined intervals. Send for copy of patent and terms. Address, A. A. Wofford, Statham, Ga. my

FOR SALE—Patent No. 904,498. An attachment to be used on all kinds of farm implements in tilling the soil. Reduces cost from 25 to 50 per cent, and gives better service. Address, John Pierson, Ingersol, Okla. my

FOR SALE—Patent No. 896,030. Improved Singletree for use in orchards, vineyards, hop yards, etc. No trees or shrubs destroyed where this singletree is used. Will sell like hot cakes in fruit-growing localities. Write A. E. Levins, Vernon, B. C., Canada. my

FOR SALE—U. S. Patent No. 903,582, dated Nov. 17, 1908, Canadian Patent No. 110,664, dated March 14, 1908. Improved Toaster. One lady writes, "I find it one of my most useful household utensils." Costs 5 cents. Retails for 35 cents. Address, J. J. Frith, Boissevain, Manitoba, Canada, my

FOR SALE—U. S. Patent No. 902,576 and Canadian Patent No. 112,536. Collar Stay. A very useful thing. Cheap to manufacture, and great seller. Can be used on any coat. Any reasonable price will be accepted. For description and drawing, address, H. C. Gustafson, R. F. D. No. 1, Box 20, Souris, N. Dak. my

FOR SALE—Patent No. 831,427. Device for suspending mosquito netting or canopies. For use either in private families or hospitals. Possesses wonderful cooling capacity. Prevents mosquitoes from getting near the sleeper or patient. Quick buyer will procure a bargain. For terms and other information address, J. B. R. Noble, No. 72 Summers Avenue, Washington, Pa. sep. 09

WANTED.

WANTED—A power machine for making wire fence. Any one having same for sale, write me stating particulars. Address, O. A. Crist, Canal Winchester, Ohio. jy

WANTED—An individual or corporation to manufacture on a royalty my patent No. 904,127, on a manure spreader. Built to fit an ordinary farm truck, with a capacity of from 50 to 100 bushels, and a spread from four to eight feet. If interested write me, Loren G. Herrick, Luverne, Minn. my

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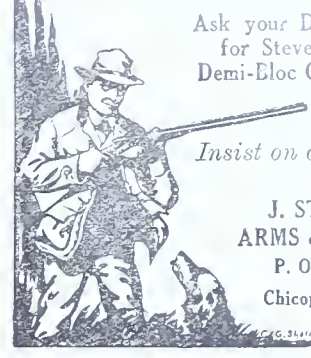
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New Points About Copyrights.

The new copyright bill which takes effect July next, was reviewed in these columns in our last edition; but so many and sweeping have been the changes in the measure that they deserve further comment. One of the features of the new law is that it is no longer incumbent on authors and publishers to take out copyright before publication. This protection may be taken advantage of at any time following. In the case of the foreign author, he is given a copyright ad interim for 30 days following the publication of the book in his own native land. If the book is not issued from an American press in the 30 days grace allowed, then it may be imported from abroad on payment of the ad valorem duty of 25 per cent. If it is published here, the foreign copy may be imported only for non-commercial purposes. No collector may import more than one copy. Two copies were permitted by the old law. The importation of piratical copies of any work copyrighted is prohibited, as in England, and the importation of any books, even though authorized by the author or proprietor, which have not been produced in accordance with the manufacturing provisions, is likewise prohibited. The bringing in of even a single copy is forbidden, if the book be a foreign reprint of a work by an American author copyrighted in the United States.

Manufacture in the United States is required in the case of a book not only as regards the setting of type, but "if the text be produced by lithographic or photoengraving process, then by a process wholly performed within the limits of the United States." This also applies to illustrations of a book, and to separate lithographs and photoengravings, "except where in either case the subjects represented are located in a foreign country." The printing and binding of the book must also be performed within the United States. Photographs are no longer subjected to the present requirement that they "shall be printed from negatives made within the United States or from transfers made therefrom." The provisions in regard to typesetting in this country do not apply to "the original text of a book of foreign origin in a language other than English." These clauses of the new law have been criticized by Professor Munsterberg, of Harvard, on the ground that it is not seemly for the United States to compel foreign publishers to send their works to this country to be set up in type and to have their engravings and lithographs made here, even if foreign workmen are more skillful and our own desire protection. This selfish stipulation, says the professor, is one of the things that keeps America remote and provincial, so that an American book is seldom seen in Europe. It also keeps us out of the circle of civilized nations in the matter of literary property, and prevents our admittance to the Berne Convention, to which most of the enlightened countries belong. This convention puts the foreigner on the same footing as the native, so far as concerns protection against the theft of his literary property.

Protection of Individual Inventors and Small Manufacturers.

The editor is in receipt of the following, from a New England firm:

"We beg to inquire if there is a society of inventors or manufacturers interested in procuring legislation to their advantage. This company finds that the greatest difficulty in the way of doing business is not so much hard times, as the loss and expense due to the persecution of the larger corporations."

There is no such society in existence, so far as the editor is informed; but there is unquestionably a field for some such association to protect the individual against the corporation. In invention, as in practically all lines of industry, the small manufacturer, or the inventor himself, is not given a fighting chance. The great electrical firms, the railways, the typewriter combinations—all the trusts which are interested in patents—and there are few which have not at least an indirect concern with them—employ agents to watch the field of invention. If a man brings a novelty in car buffers, say, to a railroad company, clever lawyers examine it in order, first, to find out its practical utility; and second, if this is established and it appears desirable to own the patent, to get possession of it without regard to the rights of the owner. Careful searches are made in the hope of discovering previous patents that may anticipate the invention so closely as to render it worthless, for practical purposes. The claims are subjected to minute scrutiny, and woe to the patent if they are not drawn so as to ensure validity. If, as a result of this thorough investigation, it appears that the patent would not stand the test of the courts, the company simply adopts it and manufactures it, heedless of the protests of the inventor. If, on the other hand, it transpires that the patent has some value, the corporation may, on grounds of expediency, offer a small sum to the proprietor. It is to his interest to accept it, however incommensurate with his own conception of the value of his device; for if he refuses, the chances are that the company will ignore him and appropriate the invention, and he is practically helpless. The rank and file of inventors are not in the millionaire class, and it takes no less than a fortune to fight a corporation through the courts, with the various recourses of taking testimony, postponing hearings, appealing and the legal quibbling that delay the final decision. And if this is in favor of the inventor—by no means a foregone conclusion—the question of damages or profits arises to perplex the judgment. For who could say that a ribbon reel attachment to a typewriter increased the sales of that machine? Who could estimate how much it benefited the company, or how much loss the inventor suffered? If there were a provision, as in the new copyright bill, that a small royalty were to be paid on each part manufactured, there might be some basis of adjustment. As it is, the court must rely on conjecture, and it is rare indeed that the final award is satisfactory to the plaintiff and pays for the legal proceedings. In fact, the American inventor is not given a "square deal," under the present system of laws. If republics are notoriously ungrateful, trusts are as certainly unprincipled. There are even those who assert that foreign countries are outstripping us in electrical devices and in scientific achievements, because of the throttling of independent effort in this country, which has always prided itself on being without a peer in the field of invention.

The firm quoted above offers the following as a possible solution of the problem: "We suggest that a publicity association be formed, with local branches, for the purpose of informing public spirited citizens of the growing difficulties in the path of the small manufacturer and inventor. Their enterprises are crowded and often crushed by the corporations and trusts, whose larger capital and the absence of proper laws enables them to employ means and men to do their bidding, whatever that bidding may be or lead to." Some such method might be found effective, if properly conducted. At least, it would do no harm to try it.

Selling Patents.

One of our correspondents writes: "What is the most advantageous way an inventor can bring his invention before possible buyers, with the end in view of selling his patent outright, or finding a manufacturer to place it on the market on royalty. If he should fail in the above and wish to market the invention in his own name, which is the best medium to reach dealers in his line of goods: By personal letters, which necessitate time and labor, or by judicious advertising to the trade he desires to reach, which is also expensive and in some cases does not bring satisfactory results?"

We would like to hear from our readers on this subject. We will give space to any letters received, as they may be helpful to others as well as to the correspondent who writes. There are numerous books which treat on this subject, but no book can possibly tell a man how to conduct his business. Something must be left to the individual; he must decide in each particular case what is the best course to pursue. The editor happens to know of a plan which proved profitable in one instance, and we offer it for what it is worth. An inventor devised a certain tool that was capable of universal use. It was what might be termed a household tool. He had no money to manufacture it, and such a proceeding would have involved the employment of salesmen throughout the country. He did not want to sell it outright to one of the big hardware concerns, for he would then have received a few hundred dollars for the device, the buyer reaping the profits. So he went to a manufacturer of hardware specialties and made an agreement for him to make the tool at say, 75 cents each. The inventor stipulated that he could not only supply himself at that price, but the manufacturer could fill orders from anyone who purchased territory under the patent. He then traveled around the country, selling the implement. He was a good talker, and as he thoroughly understood the merits of the invention, he succeeded in attracting attention wherever he went. He would visit a town, put up at a good hotel, and proceed to demonstrate the device. Of course that smacked a good deal of the methods of the street fakir, but he had no false pride and knowing that he had a useful article to sell, he followed this method in one town after another. When he had succeeded in arousing interest in each place, he would ask the hotel proprietor for the names of one or more persons who had spare time and some money to invest in a new enterprise, and he would go to them, show what he had accomplished in a brief period of time, and offer them the county right for from three to five hundred dollars. When a man purchased a county right, he would give him the name of the manufacturer of the tool, together with a deed authorizing him to obtain articles at the price agreed upon by the manufacturer. The inventor would then visit another town, with the same result. Later he employed one or two trustworthy agents to carry out the plan more widely. These men did not always achieve the same success as the originator of the scheme, but their efforts, combined with his own, brought him in a steady income. Each purchaser of a county right felt it his duty to order a supply of the devices, so that he could sell them and get back the money he paid for the license. It goes without saying that not all these agents were successful, for some men could not sell a gold mine, if they had it; but the inventor is comfortably well off, thanks to his device, and is now the treasurer of a city not far from Washington.

Of course this plan would not work in every instance. The success of each particular invention depends upon a variety of factors. The ability of the inventor to awaken interest and to

sell the tool, together with the admitted merits of the article in this case, were undoubtedly potent elements. It was something that every household needed, and it was a device that could be readily sold at sight.

We are satisfied that few inventions are sold through personal letters or by correspondence. We do not believe that public attention is gained by such methods. We are inclined to look with greater favor on placing advertisements in trade journals. It is impossible, however, to state a rule that will fit every case. Some inventions never will be sold, simply because they never should have been made. Some inventions are ahead of the times. Some inventions are too expensive to construct. Some can never be manufactured by present methods. We solicit a full discussion of this question, believing that it will be of advantage to all.

Bleaching Flour.

In view of the decision of the Secretary of Agriculture against bleached flour, it may be of interest to our readers to briefly review the situation. Some bleaching agent has for years been mingled with the flour, generally in the form of gas. One method produces gas by passing a mixture of air and so-called "alkaline gas" through a heated platinum tube. The most modern practice, however, depends on the electrolysis of acids. This process—which is not fully understood even by men who work in the electrical field—is based on an invention of a few years back. One form of apparatus commonly employed by millers consists of a dynamo, with which an induction coil is connected in series, two pair of electrodes and a pump. The induction coil holds down the current at the moment the electrodes are brought into contact, and conversely, produces a long-drawn-out arc as the electrodes separate. The pump draws air through the arcing chamber which encloses the electrodes, and discharges it into the mixing reel, where the gas is brought into intimate contact with the flour. It will be seen that the gas consists simply of air which has passed through this electric arc.

Secretary Wilson holds that nitrogen peroxide is introduced into the flour in bleaching it, which lowers the strength of the product, besides making it possible to mix inferior wheat with wheat of the average quality, thus rendering the bread made from such flour deleterious to the consuming public. There has been much protest against his action, not only on the part of millers but of bakers, who say that it will be impossible with the new flour to furnish the white bread demanded by their customers. It is interesting, in this connection, to remark that although the bleaching of flour is a simple matter, corn meal fails entirely to respond to the process, showing no effect after treatment with the strongest gas.

New Spiral Bearing.

A spiral bearing which, it is claimed, will effect a saving in power and at the same time dispense with the use of lubricants, consists of a journal surrounded with spiral ridges, around which move small rollers with spirals also surrounding them, both journal and rollers being encased in a box having spiral ridges on its inner or concave surfaces. The rollers are so designed as to engage the surfaces of the ridges on the journal and the boxing. There is a continuous passage of air through the bearing, which serves to keep it cool, and it needs little attention. The saving in power over all "static" bearings is said to be more than 65 per cent—certainly a most remarkable showing if it is substantiated in practice.

Compressed Air Typewriter.

At a recent exhibition in Berlin, a typewriter was shown which is operated by compressed air. A horizontal type wheel is kept constantly rotating at a rapid rate, on the principle of some printing telegraphs. On simply touching a key, the corresponding letter on the typewheel is caused to print on the paper, by being forced forward by compressed air. It takes only 1-120th of a second to print a letter, and thus the speed of the apparatus is practically unlimited, or at least far above that of any operator. Some such device has long been needed. The present forms of mechanical writers are out of date, in that the work of printing each letter has to be done by the fingers, which involves fatigue and slow speed. Several forms of electrical typewriters have been devised which are designed to work in somewhat the same way. All the fingers have to do is to touch the keys; the work of printing is done by electricity. In the linotype machine, in spite of the apparently cumbrous mechanism, the work of the operator is really much less than on an ordinary typewriter, as the merest touch releases finely adjusted triggers, which transmit the power to the apparatus.

New Germicide.

An important step forward in the prevention of bacterial diseases is due to the recent studies of two German professors, described in a report from our consul at Chemnitz. These investigators have found that remarkable results in the field in question are obtained by the use of antiformin. This is a trade name given to the alkaline liquid prepared by the addition of caustic soda to a solution of sodium hypochlorite, familiar to the public for years as a bleaching agent, for the removal of ink and fruit stains, etc. Antiformin, which is encountered in commerce as a clear, yellow liquid, destroys most effectively and rapidly the bacteria of dysentery, cholera, typhoid, diphtheria, and even bubonic plague. These germs are killed when brought in contact for a few minutes with weak solutions of antiformin. A small amount of the disinfectant added to water containing these germs causes them to disappear, entering in fact into solution, much as a lump of sugar would dissolve. This property of antiformin renders it admirably adapted for the purification from bacteria of potable water, and for the complete disinfection of sewage.

Strange to say, the bacteria of tuberculosis show resistance against the action of this new germicide; but in other respects antiformin promises to be of great value in connection with the world-wide crusade being waged against disease.

Irrigation and Drainage.

The old fashioned process of digging ditches and permitting water to flow through them by means of gravity, has given place to more up-to-date methods of irrigation. In Southern California, an automatic system is generally used, in which the water is first taken from a reservoir into a concrete measuring box, the height of which varies according to the pressure needed to force the water over the highest points to be supplied. The rate of flow through the box into the pipe line is measured by a weir connected with an aperture at the top of a partition placed near the end of the measuring box. The trunk line leading from the box is constructed of concrete joints, cemented together in the bottom of the furrow that reaches across the highest points of the section of land to be irrigated. To this trunk line hydrants are connected, also made of concrete pipe, and having several holes drilled in them, in which are inserted galvanized iron spouts. By means of circular iron valves in the hydrants, just below the spouts, the supply of water is regulated, these being tightly closed when water is carried through depressions. Even on up-grades, the fluid can always be delivered without pressure, by adjusting these valves. The system is especially adapted for groves or gardens, and a hydrant is placed at the end of each row of trees. Being constructed of concrete and iron, the system is most durable, and the water is under easy control.

A still more modern method represents another application of electricity to the purposes of our many-sided life. It consists in sinking wells and raising water to the surface by means of electric pumps. Under favorable circumstances, an electrical pumping plant can be installed at a cost of $4 an acre and operated at a further cost not exceeding that amount annually. The cost of a gravity system of irrigation is about $13 per acre, and the annual expense of water supply about $1.60. The windmill pump, so commonly seen on farms, is unreliable because of the variability of the wind, and its cost is heavy. In the electric system, these disadvantages are obviated.

New methods of draining land are also coming into use. A system which is employed on two thousand acres of marsh land in Michigan, consists of a series of high and wide dykes, with broad ditches within. The dykes are built and the ditches dug by a dredge that begins and cuts a channel around the tract, the earth removed being dumped outside to form the dyke. Small ditches run across the ground and join the main ditch. At the lowest corner is located a power house with a monster water wheel, under which is a sluiceway of concrete. The shaft of the wheel is so adjusted that its wood paddles are within a quarter of an inch of the walls and bottom of the flume. On the outlet end, where the wall is rounded to fit the circumference of the wheel, the ends of the paddles slip along the surface and discharge the water without. The wheel is 25 feet in diameter and 4 feet wide, and is made of steel. Wooden paddles are bolted on at an angle to the spokes, in order to allow the water to flow freely as the wheel revolves and the paddles pass the mouth of the sluiceway. This is necessary because the water is not raised as high as the wheel axis, at which point the spokes would be parallel to the surface of the stream. The great wheel has aroused much interest because of its novelty and size. It also costs very little to operate, and works very rapidly. It drained 7 miles of a 34 feet ditch, 6 to 7 feet deep, in less than ten hours, which gives an idea of what it could do in draining swamps now covered with water all the year round.

Creosoted Pavements.

Paving blocks made of creosoted wood are fast gaining in popularity and fame in this country, says a writer in the *Engineering Digest*. This is considered the best pavement by the engineers of London and Paris, where it has been subjected to the heaviest traffic in the world. Parts of New York are paved in this way, and the results have been satisfactory. Although the material is wood, it will outlast any other pavement. The reason assigned is that most others are brittle and break, not having the slightest elasticity, while wood will give rather than wear under heavy travel. It is practically noiseless, and its elastic nature makes it the easiest footway for horses. The woody fiber standing upright, an excellent hold for the animals is afforded.

Creosote is a powerful germicide, and this makes the pavement a health protector rather than a disease breeder, as many streets are. On most kinds of pavements the dirt and filth which accumulate are ground into a fine powder by the traffic, and the slightest breeze floats it in the air, making it disagreeable and unhealthy for all passers-by. With creosoted wooden blocks, the dirt is compressed by the passing of a wagon, and is not ground into powder, as the wood being soft will not pulverize it. The dust will not float in the air, and is easier to clean up.

Creosoted wooden pavements are particularly adapted for use on bridges, on account of the light weight, being less than half that of vitrified brick. The difference amounts to several hundred tons on a large structure, making quite an item in the cost of the steel necessary for the construction. When properly treated, wooden blocks are impervious to water, as all the pores of the wood are filled with creosote. This method has been in use for so many years that there is no doubt as to its preserving qualities.

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Sash-balance.....R. T. Axe
Sash-fastener.....C. J. Holzer
Sash-lock.....L. M. Greeno
Sash-lock.....G. Hilpert
Sash-weight, Sectional.....W. S. Sanborn
Saw carrier, Crosscut-.....W. M. Ruggles
Sawing-machine.....W. S. Overlin
Sawmill set-works.....H. M. Lofton
Scaffold-jack.....J. Schwilling
Scale, Automatic weighing-.....N. Nilson
Scale, Milk-weighing-.G. R. and M. L. Meloney
Scarf-pin, brooch, &c.....L. Kantor et al
Scoop.....H. B. and J. A. Sauerman
Screw and other fastening ornamental cap.....R. S. Bowen
Screw-propeller.....A. R. Weisz
Separator.....D. K. Swartwout
Set digger, Onion-.....C. C. Smith
Shade bracket and curtain-pole holder, Window-.....P. McNeil
Shade fixture, Adjustable window-..S. D. Baird
Shade-holder.....W. S. Stapley
Shade-roller.....C. M. Eveleth
Shade-winder.....B. Price
Shaft-aligner.....A. S. Church
Shaft-coupling.....D. T. McNiel
Shaft-hanger.....A. O. Wolf
Shears.....C. S. Shaw et al
Shears, Slide-cut.....F. S. Polley
Shipping-crate, Collapsible....T. O. Scott et al
Shoe, Brake-.....G. M. Beard
Shoe-shining bracket.....J. C. Walsh
Shoe, Swimming-.....L. Marrotte
Shoulder and body brace and hose-supporter, Combined.....L. J. Knowles
Sifter, Ash-.....C. E. Devermann
Sign.....F. E. Caywood
Signaling system.....N. B. Cregier
Siphon, &c., protecting-guard.....D. Landau
Skip or load carrier.....A. Lambert
Smelting-furnace.....A. Koch
Smelting furnace, Ore-..J. T. Jones (Reissue)
Smut-machine.....R. J. Owens
Soap-holder.....P. W. Smith
Sodium sulfid.....E. H. Strickler
Solid substances from liquids, Vacuum drum-filter for separating.....H. Hencke
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Spectacles.....J. Savoie
Sphygmomanometer.....L. F. Bishop et al
Spooler, spinning, or similar machine yarn-cleaner.....J. R. and W. B. McColl
Stage-scenery, &c., Apparatus for raising and lowering.....A. Williams
Stage-setting.....C. F. deSoria et al
Stamp, Atmospheric.....C. H. Krause
Steam-boiler, Multitubular.....J. H. Plumen
Steam-generator, Electric-arc..W. W. Wonner
Steam-motor, Rotary.....F. W. Meyer
Still, Domestic.....F. R. Daley
Stock-marker.....G. M. Jackson
Storage-battery jar.....C. W. Bentley
Store-front and show-case construction.....A. G. Higgins
Stove, Revertible-draft.....E. R. Stasch
Strip-perforator.....J. S. Bancroft et al
Supporting frame, Mattress-.....G. W. Bent
Suspenders.....W. Freeman
Sweeper, Pneumatic.....W. P. Leister
Switch-point thrower.....C. Weiss
Switch-rod connection.....J. G. Wise
Switch-thrower, Automatic.....T. Baham et al
Table support, Drafting-.....N. W. Dexter
Tag.....C. C. Blake
Tag-fastener.....I. Kaufman
Talking-machine, Magazine.....C. E. and W. H. Krueger
Tank-operating device, Flush, 2 pats.....B. O. Tilden
Tap-head, Automatic.....I. A. Douglas
Telautograph.....E. Belin
Tapping-head or thread-cutter.....G. A. and L. E. Miller
Telephone apparatus.....F. S. Weyrs
Telephone-call-recording machine...H. Fascher
Telephone-pole.....E. J. Newhall
Telephone-receiver.....J. Dixon
Telephone-receiver.....A. Rector
Telephonic-exchange switchboard.E. A. Graham
Textile-material-combing machine..C. Kröger
Thresher screen-leveling device.....J. Martyn
Tie.....J. H. Stewart
Tie-clasp.....L. C. Hicks
Tie-holder.....G. Bullock
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Tool, Screw-thread-cutting.....F. E. Ross
Track-section tram-rail system, Movable-.....J. Hyslop
Tramway buckets, Traction-rope-gripping device for aerial wire-rope..J. H. Montgomery
Transplanter.....C. D. Briddell
Transportation system.....W. C. Carr
Trip-guard.....W. J. Parrott
Trolley-catcher.....G. W. Kramer et al
Trolley-pole.....G. T. Barr, Sr
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Tubes from metal strips, Machine for the manufacture of.....N. Heid
Tubes of grain-drills, Mechanism for raising and lowering.....J. Stoland
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Turbine governor, Elastic-.....J. Wilkinson
Turbine, Steam-.....J. F. M. Patitz
Turbine, Steam-.....F. H. Linder
Turn-table.....F. Kobler
Turpentine and rosin from resinous woods, Removing.....H. T. Yaryan
Type-casting machine.....J. S. Bancroft et al
Type-writing machine.....E. H. Berry
Type-writing machine.....D. Briggs
Type-writing machine.....J. D. Daugherty
Type-writing machine.....W. P. Keene
Union or combination suit.....F. Guetthoff
Universal coupling.....G. W. McClintock
Unloading device.....J. Tribe
Valve.....N. C. Bassett
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Valve, Automatic.....J. B. Perkins
Valve, Check-.....C. J. Zillgitt et al
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Valve-gear.....H. Sanderson et al
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Valve structure.....H. White
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Vehicle, Electrically-propelled road-.H. Ducasse
Vehicle recoil-check.....H. A. House
Vehicle, Short-turn.....H. F. Gleason
Vehicle-spring.....W. W. Blair
Vehicle-spring.....J. F. Beatty
Vehicle-spring.....F. N. Emley
Vehicle-spring.....C. Owens
Vehicle-wheel.....S. H. Garst
Vehicle-wheel.....T. Midgley
Vehicle-wheel.....C. W. French
Vending device.....C. C. Donnell
Veneer-scoring mechanism.....W. W. Wood
Violoncello-support.....J. A. Gould
Vise.....W. Keirn
Vises, Attachment for the jaws of.....D. E. Shankland et al
Wagon-brake.....C. F. Liebly et al
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Wall and ceiling, Fireproof..A. De Marquis et al
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Wall-lining.....W. Lemb
Wall, Reinforced-concrete retaining-.E. Godfrey
Wardrobe garment-support.....W. Freeman
Washing-machine.....A. C. Willis
Washing-machine.....F. Dunsmuir
Watch-stem.....G. Hart
Water-closet cabinet for infants....G. Johnson
Water-conductor.....W. J. Minns
Wave-motor.....T. J. Beaudette
Weather-strip.....J. Kammerer
Weight-carrying mechanism....C. H. Seymore
Welding by electricity, Apparatus for.....C. E. Thompson
Wheel antiskidding tire attachment..H. H. Frey
Wheel driving mechanism, Motor-road.....W. Lorenz
Wheelbarrow.....J. E. Armstrong
Whip, Drover's.....C. E. Smith
Wind and stringed instrument, Combination..A. Herrling
Window-frame glazing-strip....T. A. Williams
Wire-gate fastener.....J. W. van Newkirk
Wire-stretcher.....D. O. Miner
Wire-stretcher, Fence-.....J. R. Locke
Woodworking-machine attachment.E. Sodergren
Woven fabric.....W. B. Lange
Wrench.....J. M. Kearnes
Wrench.....T. H. Mumma
Yoke.....W. T. Minor
Yoke, Cattle-.....E. H. Rook

DESIGNS.

Bedstead.....R. Naysmith
Chafing-dish and stand.....S. Sternau et al
Clock-case.....W. H. Richards et al
Emblem, Masonic.....H. W. Randall
Emblem or fob jewel.....M. O. Discher
Key.....C. L. Ledin
Padlock.....C. L. Ledin
Pencil-case.....E. Pearl
Sign.....C. C. Wortley
Stove.....E. W. Anthony
Lamp and support therefor, Electric.....R. E. Richardson
Spoon, fork, or similar article.....S. Stohr

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Account-keeping system.....D. L. Cline
Adjustable gage.....S. F. Atkinson
Adjustable mold.....T. G. Johnson
Aerial tramway, Marine.....G. W. Jackson
Agricultural implement.....E. Weerts
Agricultural implement.....W. Wright
Agricultural implement.....C. Schardt
Air and controlling its temperature, Machine for humidifying and cleansing.D. P. Gosline
Air-brake, Fluid-pressure.....W. M. Austin
Air, Compressing.....W. K. Richardson
Air-compressor.....G. Foll
Air-compressor.....H. Wilcox et al
Air-conditioning machine.....D. T. Gosline
Air-generating apparatus....R. von Foregger
Aldehydes, Making.....C. Ellis et al
Anchor.....F. Baldt, Jr.
Anchor, Earth-.....F. B. Miller
Ash-pan, Locomotive.....T. W. Heintzelman
Automatic switch, Safety.....F. M. Hall
Automaton.....C. W. Clark
Automobile rear-axle-driving mechanism.....A. Winton et al
Automobile-wheel hub.....A. A. De Mars
Axle.....J. E. Symons
Axle-box and spindle.....B. E. and M. E. Stevenson
Background-support.....J. A. Holmes
Bag-filling machine.....P. A. Frye
Bag-holder.....G. M. Clagett
Band-saw guide.....J. A. Ansley
Barrette.....J. Wilcox
Battery-chute.....C. O. Poor
Bed-canopy.....J. N. Moody
Bed, Folding.....P. G. Hubert
Bed, Press-.....F. C. Leethem
Beefsteak-tenderer.....G. C. Givens
Beer, Brewing.....L. Nathan
Bell, Electric signal.....H. W. Eden
Bicycle-pump.....C. E. Speck et al
Binder.....C. E. Richardson
Binder, Loose-leaf.....J. S. McComb
Binders, Sheet for loose leaf...J. S. McComb
Board-making machine, Cellular.....S. M. Langston
Book, Cumulative, 3 pats.....T. Scholes
Book-rest, Adjustable.....L. Valentine
Book, such as ledger, order-book, &c., Loose-leaf.....A. T. Warne
Boot or shoe heel-cushion.....A. A. Meyer
Bottle-sealing device.....H. P. Roberts
Bottles or other receptacles, Machine for filling.....T., Sr., and E. L. Baines
Box.....E. L. Ansorge
Box coupling, Junction-.....E. S. Morrell
Box-covering machine.....T. H. Wible
Box-folding machine.....E. W. Labombarde
Box lock, Carrier-.....L. L. Savoy
Box plane, Core-.....C. E. Martin
Bronzing-machine.....H. Lamberger
Broom-holder.....L. J. Powers
Brush.....K. Watanabe
Brush.....H. Alexander
Brush-holder.....W. A. Turbayne
Bucket, Dumping-.....J. H. Lance
Buckle.....H. D. Sargent
Buckle.....F. Loeb
Building construction.....S. Toye
Building, Fireproof.....M. J. Dawkins
Bundle-tie.....J. E. Wright
Burial case or vault....A. M. McCormick et al
Buoy for saving life and for communicating between a ship and other objects or the shore.....T. Bredsdorff
Burial-vault.....R. G. Weltner et al
Butter-cutter.....J. G. and B. B. Carmichael
Cabinet.....E. Keltz
Cable-tension holder.....E. J. Hoode
Cage-lock.....J. W. Unger
Calendar, Perpetual.....J. F. Stimson
Calk, Detachable.....W. J. Koontz
Camera-finder.....W. E. Shanley
Camera-shutter-operating device, Chronometric.....W. M. Martin et al
Camera-tripod.....W. C. Evans
Can cover, Milk-.....R. Bray
Can cover, Milk-.....T. Bray
Can-top.....H. L. Freeborn
Canning-furnace.....C. C. May
Capping-machine.....F. Mueller et al
Car-coupling.....D. Alford
Car door, Passenger-.....S. R. Skov and T. Scullin
Car, Dump-.....F. Seaberg
Car, Hand-propelled.....C. D. Orcutt
Car passenger-registering apparatus.....J. J. McDermott
Car pipe-line coupling.....P. A. Senecal
Cars, &c., Route or destination indicator for tram-.....A. K. Baylor
Cars, End-gate for mine-.....F. C. Greene
Carbon-black from peat, Obtaining.J. E. Smith
Carbons, Apparatus for forming perforated.....M. W. Allen
Carbureter-controller.....A. C. Stewart
Caster-wheel.....J. F. L. Uhl
Casting safe-knobs, Means used for.....W. T. Bausmith
Castings of aluminum and aluminum alloys, Making.....E. Blough
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Cement.....T. Jones
Centrifugal separators, Automatic feed-regulating float for.....C. A. Edund
Chain hoist, Friction.....R. E. Cross
Chain-hook.....R. Owen
Chair with adjustable seat.....J. A. Wilkinson
Channeling-machine.....W. Prellwitz
Chimney-cap and ventilator.....R. T. Merrill
Churn.....J. B. Mellinger
Cigars, Device for inciting the ends of.....C. G. Taylor
Cigarette-holder.....W. Beamish

Circles, Instrument for describing arcs of....A. W. Allen
Clay condensers for retorts, Machine for molding.....R. Garrison and G. W. Whipple
Clock.....V. E. Duncanson
Clockwork pivot-holes, Hardening.C. Grivolas
Clothes-drainer.....A. P. Shepherd
Clothes-drier.....J. Surprise
Clothes-steamer.....W. B. Grover
Clover-seed-buncher trip device...O. L. Keiser
Clutch.....J. C. Potter et al
Clutch.....E. C. Smith
Clutch, Friction-.....A. N. Woods
Coal-leveling machine.....C. Rouse et al
Cock, Gage-.....A. H. Jettinger
Cock, Gas-.....A. G. Sherman
Coffee or tea container.....W. Kingsbury
Coin-holder.....W. H. Garland
Coin separator and counter.....J. M. Johnson
Collapsible box and crate.R. L. McFarland et al
Collapsible rack.....R. A. Wilson
Collar ironing, dampening, folding, and shaping machine.....J. S. Miller et al
Column-clamp.....J. E. Langford
Comb, Back-.....W. C. Krueger
Comb-cleaning attachment for strippers or harvesting-machines.....A. J. Brownscombe
Combination-lock.....O. M. Larkin
Composition board and producing same.....H. L. Hollister
Composition of matter and tempering same....M. S. Woelfel
Compressor quantity-regulating device, Rotary fluid.....A. Huguenin
Concrete blocks, Molding.....H. Briggs
Concrete building-blocks, Gage for the spacing apart of.....C. M. Maddux
Concrete floor.....F. W. Skinner
Concrete piers, &c., Corner-plate for.....J. C. Sunderland
Concrete walls, Manufacture of.C. C. McCarty
Concrete walls, Mold for use in erecting.....C. H. Witthoefft
Connector, Terminal.....E. Cuno
Cooling apparatus.....A. E. Iveson et al
Coop, Brood-.....D. M. Primm
Core.....J. Wittliff
Corn-husker.....T. H. Butler et al
Corn-slicing machine.....L. H. Kellam
Cotton-picker.....C. C. Wilson
Counter-controlling mechanism.....W. H. Sheppard
Coupling.....R. Whitaker
Crate, Collapsible.....L. E. Pound
Cream-separator.....E. R. Bailey et al
Creosote, Obtaining strong aqueous solutions of.....D. Lodigiani
Crop-treating machines, Shock-handling attachment for.....J. B. Schuman
Cultivator.....A. C. Newcomer
Curtain-fixture.....A. Hansen
Dental plugger.....W. G. Church
Desk, School-.....J. M. Taylor
Differential mechanism.....B. W. Brockett
Disinfector.....F. J. Gaus
Display-box.....M. W. Just
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Distributing-receptacle.....W. R. Comings
Ditching-machine.....A. I. Hovland
Door.....A. J. Ellis
Door closer and check.....J. Bardsley
Door, Folding grain-.....J. E. Chantler
Door-operating device, Mine-....J. M. Sausser
Draft-equalizer.....J. O. Price
Draw-bar, Railway.....H. L. Allen
Dressing-table.....C. A. Warren
Drier, Sand-.....J. A. Mumford
Drinking-fountain.....P. S. Hamrick et al
Driving mechanism.....L. A. Hill
Drying structural parts, Means for..A. Knapen
Dye and making same, Azo....C. Jagerspacher
Dye and making same, Gray vat..J. Hoffmann
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Egg-desiccating apparatus, 2 pats..A. Fullerton
Electric accumulators, Regenerating.C. Luckow
Electric-brazing apparatus.....W. M. Fulton
Electric-closet appliance.....M. D. Murray
Electric head-cap.....M. Branaman
Electric-light cord-support...M. N. Narum et al
Electric switch or signal controlling apparatus.....N. T. Shaw
Electrical control system.....P. H. Thomas
Electrical distribution system...A. S. Hubbard
Electrical distribution system.....F. J. White
Electrical heater.....J. A. Mears, Jr
Electrically-driven stages, lifts, and the like, Device for controlling.....A. Böhmer
Electrodeposits which can be removed from their base.....H. Schmidt
Electrolytic process.....H. L. Hollis
Elevating device.....E. Burk
Elevator-guide-rail oiler.....E. I. Pearson
Elevator-leg drive.....S. F. Evans
Embalming and burial casket.....C. L. Barnes
Emergency-coupling.....R. A. Terheun
Engine carbureter, Explosive-.D. J. Cartwright
Engine spark-timer, Internal-combustion-.....H. Schaaka et al
Engine starting device, Internal-combustion-..A. C. Wells
Engine starting mechanism, Internal-combustion-.....E. C. Gentzler
Engraving block.....F. A. Missman
Envelop.....S. B. Swift
Evaporator.....T. Suzuki
Excavator.....P. H. Walker
Excavator-frame structure, Traveling-.L. Mayer
Eye-shield.....A. F. Burdick
Eyeleting-machine.....J. E. McIntire
Fence.....B. Trebilcock
Fence construction.....S. R. Johnson
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Filter, Water-.....R. M. Baxter
Fire-alarm system.....J. Dönitz
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Fire-escape.....R. J. Brown
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Fly-paper holder.....A. O. Bonin et al
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Folding chair.....F. E. Tibbetts
Folding seat.....W. Kalitsky
Folding seat and luggage-box, Adjustable.....J. R. Maloney
Fork-return mechanism.....H. Richardson
Fowl-singeing apparatus.....M. B. Rennow
Fruit-picker.....L. H. Swan
Fruit-processing device.....C. F. Fleming
Furnace.....U. Wedge
Furnace pneumatic discharging apparatus.....S. E. Hitt
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Fuse, Inclosed.....P. S. Keefer
Gambrel-stick.....G. H. Poist
Game apparatus.....D. H. Talbert
Garment-holder.....B. J. Buckingham
Garment-supporter clasp.....B. F. Orewiler
Gas-generator.....R. von Foregger
Gas generator, Acetylene-...E. M. Rosenbluth
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Gate.....T. J. Van Pelt
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Granulators, Apparatus for moving material from.....W. R. Warren
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Grate-trivet.....A. S. Cooper
Grooving-machine.....H. P. Townsend
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Gun-sight.....C. H. Tessey
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Hammer, Drop-.....J. W. Wagner
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Hay-loader.....N. O. Henderson
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Hot-air furnace.....C. C. Knauss
Hub-attaching device.....R. T. Daniel
Ice-cream freezer.....F. E. Whitney
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Ice-cream scraper.....D. H. Mosteller
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Implement-clamp.....S. C. Lawlor
Index reference-file.....F. E. Richardson
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Indigoes and making same, Highly-brominated.....A. Schmidt
Insect-destroyer.....J. A. Haefele
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Iodin, Extracting.....E. Hermann
Ironing-table.....F. C. Lloyd
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Knitting-machine stop mechanism.....D. T. Berlizheimer
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Ledger.....F. H. Smith
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Lights, Smoke and beat deflector for.....J. Silverberg
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Mail-box penny-collector.....W. G. Campbell
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Mail-sack letter-holder attachment.....H. O. Richard
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Match box and safe, Automatic-feed.....I. A. Viersen
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Measuring machine, Rope-.....A. Hally
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Molding-cutter, Rotary.....L. M. Jones
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Motor-starting device.....F. J. Gucken
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Music instructors, Pointer-baton for.....F. Wheeler
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Nut and bolt lock.....R. L., Sr., and R. L. Elwood, Jr.
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Nut-lock.....A. C. Keedwell
Nut-lock.....T. H. Lawrence
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Oiling device.....M. E. Bingham
Ointment-mill.....W. O. Kaiser
Operating-table.....G. R. De Nise
Ore-concentrator.....S. K. Behrend
Ore desulfurizing and sintering apparatus....A. S. Dwight et al
Ore, Roasting and sintering....A. S. Dwight
Ore roasting and sintering apparatus, 2 pats..A. S. Dwight
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Ores, Roasting and sintering....A. S. Dwight
Ore-smelter.....E. A. Mathers
Oven, Core-.....G. H. Wadsworth
Oven, Reel-.....C. G. Tucker
Overshoe-fastening device.....S. Thorsch
Package tie or holder.....H. T. Small
Packing-case.....N. A. Smith
Packing device, Confectionery-...A. Holzweissig
Packing, Lubricating-.....J. B. Stearns
Paint-pot.....J. C. Rose
Pan-lifter.....M. Pasino
Paper box.....J. F. McCall
Paper holder and cutter, Combined.S. Nordskog
Paper-perforating machine..H. M. Lindsay et al
Pasteurizing apparatus.....H. M. A. Harders
Pavement.....W. B. Warren
Pen attachment.....B. H. Collins
Phonograph.....R. C. Farrington
Phonograph-horn.....F. M. Murphy
Phonograph-record box.....J. R. Harbeck
Photographic-film-roll spool....W. F. C. Kelly
Photographic plates, Daylight holding-envelop for.....O. N. Moore
Photographic-printing apparatus...A. J. Dick
Photographic-printing frame.....A. C. Hayden
Pier, Submarine.....G. W. Jackson
Pile-driver.....R. E. Murphy
Pin.....F. M. Swartz
Pin-coupling.....J. D. Hazlet et al
Pin-coupling, flexible.....G. F. Royer
Pipe-hanger and anchor and connection therebetween.....T. Mason
Pipe-joint, Flexible.....W. A. Greenlaw
Pipe-puller.....J. Lamberty
Pipe stem, Tobacco-.....G. W. Bowers
Pipe-wrench.....G. W. Sievert
Plane, Sandpapering hand-.....C. Delsee
Plate-handling apparatus.....J. F. Schnabel
Plate-lifter.....H. P. Magone
Plating-rack, Electrical.....D. B. Moyer
Playing-attachment adjustable tracker-board, Pneumatic-.....J. H. Dickinson
Playing-attachment adjustable tracker, Pneumatic-.....J. H. Dickinson
Plow, harrow, &c., attachment...R. L. Stalans
Plumbing-fixture.....J. W. and F. N. Palmer
Pocket-fastener and pencil-holder, Combined..C. R. Schafer
Polishing compound.....F. Gay
Pool-ball frame.....R. A. Pierce
Pot cover, Flower-.....M. Skorness
Preserving-receptacle.....L. Peck
Pressure-indicator.....W. W. Brissenden
Printing attachment for wrapping-paper reels, Automatic.....P. Grazioli
Printing-press.....A. J. Ford
Printing-press belt-delivery clutch.J. Humphry
Printing-press inking-roller....W. L. McCarty
Pulley.....J. G. Hänsler
Pulley and rope or cable holder...G. J. Batzer
Pulley-block.....F. A. Hall
Pulsator.....A. H. Gibson
Pulsator-controller, Electrically-driven.....A. H. Gibson
Pump.....E. A. Costephens et al
Pump.....P. A. Myers
Pump, Centrifugal.....W. K. Richardson
Pump for exhaust-steam and feed-water.....W. T. Harris
Rail chair, Guard-.....D. Crane
Rail-corrugation-filing-off machine.....J. Lang
Rail-joint.....F. B. Neal
Rail-joint and rail-brace.....P. Holdampf
Rail plate and brace, Combination..J. F. Witt
Rails of tramways and railways, Apparatus for cleansing the.....P. J. Pringle
Railway.....L. Gemmer
Railway-frog.....B. P. Gilmour et al
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Rake.....
Razor, Safe-.....
Reamer.....
Recording [illegible].....
Refrigerator.....J. B. [illegible]
Rein-holder.....T. A. [illegible]
Relay, Polarized.....H. J. Roberts [illegible]
Resilient wheel.....F. J. [illegible]
Ribbon fastener, Hair-.....W. E. Lemerand
Rivet holding and driving chuck.....D. C. Sasserman
Road-drag.....E. J. [illegible]
Road grader or s[illegible].....
Rock-drill, Intern[illegible].....
Rocker, Omnibus-.....
Roller-mill.....
Rolling-mill.....
Rotary engine.....E. S. and F. T. [illegible]
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Rotary engine.....A. N. Blazer
Rotative motor.....E. E. Duscheck
Route-indicator, Automobile.....F. J. Lindenthaler et al
Saddle-pad, Harness.....J. Mosher
Safe.....H. W. Neal
Safe, Wall-.....H. C. Lowrie
Sash-fastener.....C. M. Fowler
Sash-holder.....J. C. Maguire
Sash-lock.....B. Schritzler
Sash-lock.....H. W. Covert
Sash meeting-rail.....R. J. Davis
Sawing-machine, Portable.....N. C. Tevis
Sawmill set-gear.....H. R. Scheidler
Scaffold or mold for erecting concrete or cement walls for buildings....C. H. Witthoefft
Scoop, Excavating-.....G. H. Dunlop
Scoop, Self-weighing.....A. H. Arnold
Screw-driver blades, Former for.C. F. Sullivan
Screw-holder.....F. M. Jacobs
Secondary battery, 2 pats.....H. F. Joel
Separator.....G. H. Dekker
Service-box lid.....H. and P. Mueller et al
Sewer and gutter pipe connection.W. G. Cramer
Sewing-machine.....A. V. Abercrombie
Sewing-machine.....H. E. La Plant
Sewing-machine attachment.....M. J. Eidam
Sewing-machine guiding device.....W. A. Fox
Shade-holder, Combination.....J. J. Buschor
Shade holder, Window-.....I. S. Sherwin
Shade-roller support, Curtain-.....J. M. and H. H. Bryant
Shade-trimmer.....F. Hoff
Shaft-coupling, Universal.....C. Schmidt
Shafts, piston-rods, pins, tools, &c., Emery-wheel drive in machines for grinding, turning, and finishing.....A. Macdonald
Shears.....A. Westerdahl
Sheet-glass manufacturing apparatus.....F. M. Oppermann
Sheet-metal box.....A. B. Gonser
Sheet-metal wheel.....J. F. Craven
Shelf.....A. C. Coons
Shield and burner.....N. B. Creighton
Shield and form, Armpit-.....F. Baldwin
Shock-protector.....J. M. Baker
Shoe-pattern clamp.....J. J. Albrecht
Shoe-upper fastener.....W. E. Ellis
Shutter, curtain, &c, Fireproof....H. L. Fish
Shutter-fastener.....C. L. Betton
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Sign, Electric.....R. E. Belcher
Silk filaments, Apparatus for lustering and finishing.....E. Pohl
Sink stand or shelf.....S. S. Eccleston
Siphon.....J. B. Lee
Skate, Combined ice and roller.....W. H. Fitzgerald
Skating-rink, Rotary.....J. Weil
Skiving-machine pressure-roll.....J. R. Scott
Sled.....C. D. Hinebaugh
Small-arm automatic safety device..J. Tambour
Soap-holder.....J. J. McNally
Soap-shaving device.....F. Egge
Sole-channeling machine.....E. A. Webster
Sole-leveling machine.....J. H. Rigby
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Spark-plug.....A. W. S. Herrington
Spectacle contact-pad.....W. G. Fay
Spindle bobbin-clutching means, Rotatable-.....P. E. McCullough
Splice-bar.....M. K. and C. C. Gross
Spooler, Multiple.....G. A. Clark
Spring-wheel.....L. E. L. Themke
Stake-holder.....J. S. Whitworth
Stapling mechanism.....W. N. Hunter
Steam-trap.....A. Malcolm
Steel blades to solid white-metal handles, Attaching.....T. B. Lashar
Stone-cutting machine.....E. A. Chase
Stump-puller.....C. Pederson et al
Superheater.....S. Munson
Surfacing-machine.....H. Edlund
Surveying instrument.....W. H. Whitney
Swarm-catcher.....D. I. Comsa
Switch-operating mechanism.....J. W. Eads
Switch-throwing device.....P. Healy
Swivel, &c.....H. M. Eldridge
Syringe.....P. L. Wilbur
Syringe.....H. A. Mather
Table.....C. Van Horne
Table fiddle or guard, Ship's-....W. W. Lang
Talking-machine reproducing-stylus.....G. K. Cheney
Tanks, Float-controlled switch for filling.....S. W. Netherton
Tapping device.....H. Hildenbrand
Telegraphy, Wireless.....J. Murgas
Telephone instrument, Subscriber's-..A. H. Weiss
Telephone-line testing system....W. W. Dean
Telephone system...R. H. Manson (Reissue)
Telephone-transmitter attachment.....R. L. Woodward
Terminal-loop arrangement, Subway-.....G. W. Jackson

Tension device.....G. N. Williams, Jr. et al
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Ticket-holder and theater-seat diagram, Combined.....L. B. Trafton
Tile floor.....F. Parsons
Tile-mounting.....O. M. Landis
Tiles, Forming glass.....W. P. Meeker
Time-stamp.....M. W. Obermiller
Tire.....R. R. Brown
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Tire-bolt.....J. M. Fellows
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Tire mounting, Pneumatic-.C. G. Hawley et al
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Tire-tread attachment, 4 pats.....F. A. Fox
Toe-weight.....C. J. Geterman
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Tooth, Dipper-.....V. C. Thomas
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Torch, Gasolene-.....K. Dougan
Torpedoes under water, Apparatus for launching.....A. E. Jones
Toy.....M. T. C. Wing
Toy, Mechanical.....W. H. Hobdey
Trace-holder.....J. W. and J. T. Tracy
Track-alining apparatus....R. and F. B. Shaw
Train-signal system.....H. H. Sharp et al
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Tree-protector.....J. D. Clark
Trough.....H. G. Thomas
Truck.....N. W. Aldous
Truck.....W. E. Kastendike
Tubes, Making spirally-wound...C. F. Jenkins
Turbine.....E. I. Braddock
Turbine-blading.....S. Z. de Ferranti
Type-setting machines, Means for electrically operating.....H. Drewell
Type-writer attachment.....J. H. Rand
Type-writer-carriage-moving device.H. Drewell
Type-writing machine.....D. Briggs
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Upholstering device.....W. J. Dickson
Valve.....G. Brocke
Valve, Air-brake, triple.....W. M. Austin
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Valve, Controlling-.....E. R. Morrison et al
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Vehicle, Motor-.....R. Huff
Vehicle, storm-front, 2 pats....D. Argerbright
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Vehicle with three axles, Motor-...A. E. Brillié
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Veneer-machine.....J. Rendleman
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Vessel for raising and carrying submerged objects, Hoisting.....L. Parodi
Vessels, vehicles, or other moving bodies or objects, Locomotion for.....C. J. Lake
Voting and similar registering machine.....W. J. Lausterer
Voting-machine and indorsing device.....W. J. Lausterer
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Wagon-loading device.....R. Pederson
Wall, Fireproof.....J. S. Gard
Wall metal construction.....H. R. Myers
Washboard.....M. E. Brown
Washing apparatus.....F. Sochurek, Sr
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Washing-machine.....E. H. Braden
Washing-machine gearing.....A. F. Victor
Water-bag.....D. Smith
Water-elevating apparatus.....J. S. Lawrence
Water-gage.....L. Kaplan
Water-heater.....D. N. Gibson
Water in baths, Device for agitating.....H. Hoeglauer
Water trap or strainer.....F. A. Lewis
Well ejector, Oil-.....J. W. Plimpton
Wheel-lift.....J. H. D. Rosan
Winder, Mainspring-.....A. F. Robbins
Windmill.....G. F. Williamson
Window and sash holding device.O. M. Edwards
Window-bead fastener.....T. J. Daniel
Window-screen.....G. Ayres
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Window-stop.....R. F. Nichols
Wire cable.....G. B. Smith
Wire-glass articles, Producing..J. I. Arbogast
Wire-stretcher.....W. J. Estes
Wire-stretching machine....H. Edwards et al
Wood-rosser.....A. R. Wilkinson
Wood-steaming apparatus.....G. F. Hartley
Wood tank, Bent-.....S. C. Mack
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Chair side standard, Opera-.....A. Pyle
Shingle, Metallic.....G. H. Pedlar
Shoe.....J. W. Barna
Sweater.....M. C. Bronson
Type-font.....S. V. Smith
Washtub-support.....E. J. Korman et al

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Adding-machine.....D. B. Benton
Adding-machine.....G. N. Hinchman
Addressing-machine.....D. Gestetner
Agricultural implement.....J. Horinek
Air-accumulator.....W. F. Merryman
Air-brake hose, Device for coupling, uncoupling, and manipulating.....C. Geisking
Air-brake-retaining valve, Automatic.....J. M. Carter
Air-compressor.....L. A. Gates
Air-ship.....O. J. Laisy
Air-treatment apparatus, Fresh-..L. P. Leonard
Aluminous materials and products thereof, Treating.....A. C. Higgins
Amusement apparatus.....T. W. Potts
Antifolding and anticorrosive composition.....Z. Hotta
Automobile-circuit closer.....T. A. Backé
Baloon, Toy.....G. S. Rouse
Barrel-head.....I. Francis
Barrel-head, &c., fastener.....A. Wollner
Bath and basin fitting.....H. M. Weaver
Bathing-suit.....F. E. Liliedahl
Battery plate, Secondary-.....W. Morrison
Bed-pan.....A. Henhapl
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Binding-post.....H. E. Reeve
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Bottle-filling apparatus.....W. L. Ellingwood
Bottle-finishing machine.....T. M. Richards
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Bottle seal and closure.....D. A. Williams
Box-filling machines, Carrier for.A. B. Calkins
Boxes, Machine for cutting finger-notches in..F. R. Harris
Brake.....W. H. Balch
Brake-hanger.....C. H. Knobbs
Bread and cake box.....J. L. Le Munyon
Brick-pressing die.....C. E. Simpson
Briquet-machine.....D. E. Bangs
Broom-hinder.....A. Seaholm
Brush, Electrical contact-.....H. K. Sandell
Buffing-machine-.....H. J. Brewer
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Buttons, Machine for the manufacture of.....A. Prym
Cable-tightening device.....C. Krämer
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Calcium carbid, Process and apparatus for making.....J. S. Seymour
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Calendar standard, Desk-.....F. A. Hale
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Car and hose coupling.....E. Myers
Car-control apparatus, Railway-...J. B. Atwood
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Car-fender.....A. Doss
Car-fender.....F. A. Seeley
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Car system, Overhead electrical..G. Heineman
Car-tilting device, Cinder-.....R. C. Veitch
Car-underframe.....H. M. Pflager
Carbon, filament, and making same.....W. R. Whitney
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Card and calendar, Score-.....F. J. Kristofek
Card, Pictorial post-.....K. Münster
Carriage stormhood, Baby-.....B. W. Grover
Carriage-top, balance...I. O. and H. N. Baure
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Ceiling-plate, Adjustable hinged....R. Lewers
Cement building-block.....C. W. Everett et al
Cereals, Conditioning wet.....R. W. Jessup
Chair and table combined.....H. C. Towne
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Churn.....R. B. Collier et al
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Circulating system.....T. E. Warren
Clevis.....J. R. Cousins
Closet-seat.....W. L. Heap
Clothes-line holder.....H. G. Schreiner
Clutch, Friction-.....H. Druschel
Cock, Gas-.....J. E. Murch
Code, Cable or telegraph.....M. L. Sweeney
Coin-controlled mechanism.....C. F. Burkhart
Coin-holder A. T. Ballenger
Collapsible box.....F. M. Wade
Collar-stay.....H. Hammond
Collar-stuffing machine, Horse-...W. B. Estes
Column-turning-machine bearing....J. Buffelen
Concrete-block mold.....W. H. Faulkner
Concrete construction, Reinforced.....G. A. Masters
Condenser support, Steam-.....L. R. Alberger
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Conduit-coupling.....R. M. Thomas
Conduit, Flexible.....G. A. Lutz
Container.....M. D. Potter
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Cooler.....V. J. Metzger
Copying-press with pressing-levers arranged symmetrically to one another.....K. Lenck
Corset-protector and hose-supporter, Combined.....J. Linhardt
Cotton-seed huller.....C. A. Chandler
Cotton-thinner.....J. Floyd
Cotton-topper.....J. F. Thomas
Crank-pin-turning machine....W. E. Anderson
Crate, Folding.....L. P. Cox
Crates and other packages, Cushioning device for.....J. Steinbuch et al
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Cutter-sharpening device, Milling-.....C. E. Klink et al
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Dental instrument.....R. H. Gallagher et al
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Display-racks for rugs.....G. W. and P. Shindlebower
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Door-controlling device.....T. Kush et al
Door-lock.....A. Schoenman
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Door spring-hinge attachment, Lavatory-.....E. Bommer
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Electric conductor, Vapor.....O. O. Kruh
Electric conduits, &c., Hooded connector for..A. McMurtrie
Electric fire-alarm, Automatic.....E. Johnson
Electric furnace.....C. W. F. Gorrell
Electric igniter for gas-engines.....I. B. Reed
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Electric wire or conductor support.C. C. Gould
Electrical-box coupling.....R. M. Thomas
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Electrical circuit controller..H. W. Eichbaum
Electrical conduits, &c., Connecting device for..A. McMurtrie
Electrical connecting device.....E. A. Colby
Electromagnetic-wave receiver.R. A. Fessenden
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Elevator-hatchway, Flush.....H. Rowntree
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Engine governor, Marine-.....L. E. L. Themke et al
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Envelop, Collapsible parcel-.....A. Thompson
Fastening device.....P. E. Hocquard et al
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Faucet, Automatic.....A. P. Tallmadge
Fence-post.....E. E. Metcalf
Fence structure.....L. Borth
File.....S. S. Kurtz
Filter distributing-machine, Closed-.....H. W. Blaisdell (Reissue)
Fire-escape.....O. D. Alspach
Fire-escape, Automatic.....H. P. Young
Firearm, Silent.....H. P. Maxim
Fish-scaler.....G. Lafrentz
Fish-screen, Self-cleaner...G. R. Maycock et al
Fishing appliance.....E. Schildbach
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Flash-light apparatus, Photographic.T. C. Smith
Fluid-pressure engine.....W. T. Lewis
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Fly-screen.....L. M. Tully
Flying-machine.....M. Strzelecki
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Friction device.....L. H. Broome
Fruit-grader.....W. C. Anderson
Fumigating apparatus.....C. E. McFadden
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Gage and jointer, Combined raker.A. Champeau
Garment-hanger and protector..F. W. Merrill
Garment-supporter.....J. G. Morrill
Gas-burner, Electric hand-lighting.A. J. Perkins
Gas-lighter, Automatic.....J. C. Landes
Gas-pressure regulator.....R. A. Doane
Gas-producer.....G. C. F. Vater
Gas-scrubber.....E. F. Lloyd
Gasket or packing.....C. H. Van Nostrand
Gate.....E. W. Vest
Gate.....G. W. Hurst
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Glass conveying and stacking machine.....R. L. Fink
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Glass tiles, Pressing.....W. L. Mooney
Glucose, Manufacture of.....C. B. Duryea
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Gold at the bottoms of flowing streams, Apparatus for mining.....L. F. Gilman
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Hair-roll and comb, Combined.....H. Feder
Ham-salter.....F. Hachmann
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Harness and vehicle releasing device.....W. H. Davis
Harrow riding attachment.....M. Eisele
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Harvester sack-chute attachment....J. Martyn
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Incubator.....V. C. Koons
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Insulated joint, Adjustable.....T. H. Brady
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Ironing-table.....K. A. Darrow
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Jack.....W. B. Templeton
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Lamp socket, Incandescent-electric-.....A., Sr., A., Jr., and J. Weber
Lamp-socket.....R. B. Benjamin
Lamp-socket, Plural.....R. B. Benjamin
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Lamps, Producing metallic incandescent bodies for electric glow-.....F. Blau
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Lathe speed-change gearing...J. R. Back et al
Leather-strap-finishing machine..J. Z. Roberge
Letter-box.....J. E. Norgord
Life-preserver.....L. D. McDonald
Lime, Recovering waste.....J. G. Jones
Linotype-matrix.....H. Degener
Liquid pasteurizing or sterilizing apparatus..H. Christensen
Liquids, Vessel for the conveyance or storage of.....W. H. Keller
Lock.....G. H. Pings
Lock.....T. Knight
Loom filling-fork grid.....W. L. Scott
Loom-heddle.....W. H. Hartley
Loom-shuttle.....A. Buckler
Looms, Means for facilitating warp change in..A. E. Rhoades
Looper-trimmer.....W. J. Steere
Mail-bag-delivery apparatus.W. H. Van Fossen
Mail-delivery apparatus.....G. R. Godwin
Maltose, Making.....C. B. Duryea
Mangles, Machine for feeding articles to.....A. Burns
Mantle shaping and dipping machine, Light-..C. C. Travis
Massage apparatus.....K. P. Wallén
Match-box.....A. Dumas
Mechanical movement.....J. F. Cooley
Memorandum device.....S. Kahn
Metal bodies, Making compound.J. F. Monnot
Metallic blooms or ingots, Machinery for piercing.....W. U. Jackson et al
Metallic pipes or other objects, Machine for truing the ends of.....M. A. Baker
Metallic suhstances, Composition for preventing the corrosion and galvano-electric action of..Z. Hotta
Metallic tubing, Flexible.....E. Rubes
Mill guide, Rolling-.....L. Kruger
Mill roller-table, Three-high-roll-..C. L. Taylor
Mines, Electrical shot-firing machine for.....W. B. McLarty
Mitt, Base-ball.....J. Gamble
Mold.....J. F. Hill et al
Molding-machine.....M. K. Weigel
Motor-control system.....E. W. Stull
Music-leaf turner.....W. Schwarz
Musical instrument, Mechanical.J. McTammany
Nailing-machine.....W. A. Olsen
Nipples, Producing radiator-.....J. A. Field
Nut-lock.....O. Crittenden
Nut-lock.....M. Valenti
Oil and gas furnace.....J. W. Russell et al
Oil-burner.....C. T. Noyes
Ore-reducing furnace.....G. F. Rendall
Ores, &c., Calcining, desulfurizing, agglomerating, and sintering.....F. D. Weeks
Outlet or injunction box.....G. A. Lutz
Package-binding clip.....C. D. Kreps
Package-tie.....G. T. Chandler
Packing compound.....J. Klotzbuecher
Packing or shipping box.....J. T. Ferres
Paper bag.....H. W. Stuart
Paper-coating machine, Wall-.....R. Kraus
Paper-making-machine ironing and drying device.....B. J. Noyes
Paper, Method and means of treating.....A. M. Meincke
Paper receptacle.....M. A. Hill
Particles from a fluid stream, Electrical separation of.....L. N. Morscher
Pavement.....W. H. Fulcher
Pen, Self-filling fountain.....W. A. Welty
Pencil-box.....E. I. Hawk
Pendant-bow.....L. E. F. Wachter
Peroxid of hydrogen, Electrolytically producing.....G. Teichner
Phonograph-record case.....W. A. Shafer
Photographic paper.....Y. Schwartz
Photographic-plate holder.....L. Borsum
Piano-player action, Pneumatic..G. M. de Julio
Piano, Pneumatic, 2 pats.....A. Nordeen
Picture machine, Moving-.....H. S. Mills
Picture-machine protective device...D. J. Bell
Pipe and nut wrench.....G. D. Poindexter
Pipe attachment, Smoking-.....A. Speirs
Pipe-compensator.....E. Witzenmann
Pipe-coupling, Reinforced-concrete.J. M. Phelan
Pipe, Making welded.....J. H. Taylor
Pipe-support.....C. F. Clawson
Planer feed mechanism, Wood-.H. A. Perkins
Planter, Seed-.....W. L. Dood et al
Plastering-machine.....W. A. Warson
Plate-lifter.....A. Auger
Plow.....H. A. Ludtke
Plow, Gang-.....G. W. Barnett
Plow, Gang.....W. Hubbell et al
Plow, Motor.....J. and W. Paterson
Plumb-hob.....H. A. Schmidtke
Pocket-knife, &c.....C. S. Evens
Potato-digger.....L. P. Normandin
Potato-ricer.....C. D. Chavis
Potato-slicer.....J. J. Langas
Power-fluid generator.....C. J. Lake
Power-transmitting mechanism..J. N. St. Mary
Pressure-regulator.....A. C. Durdin, Jr
Printing-press.....A. Knobel
Printing-press gripper.....B. F. Berry
Printing-press moistening mechanism.A. J. Ford
Printing press, Rotary-cylinder web.....H. F. Bechman
Propelling mechanism.....J. C. Fleming
Pulp-separator.....B. J. Noyes
Pulverizer.....W. Gruendler
Pump.....J. H. Owen
Pump.....W. O. McCurdy
Pump.....S. Perry
Pump, Milk-.....E. Lindblad
Pump non-freezing attachment....S. B. Bower
Radiator, Steam-, 2 pats.....R. Warg
Rail and rail-joint straightening device.....G. W. Martin
Rail-bond.....A. Light
Rail-brake, Pneumatic.....P. O. Adams
Rail-grip.....A. Corts
Rail-joint.....F. L. Evans
Rail-joint.....C. P. Lancaster

Rail-tie....D. W. O'Neil
Railway-crossing....P. O. Adams
Railway-derailer....T. W. Epling
Railway-gate, Automatic....M. H. McCoy
Railway-rail bearing....J. T. Richards
Railway signaling....S. D. Strohm
Railway signaling system....C. J. Coleman
Railway steel tie....A. T. Charlier
Railway switch and signal controlling and operating system....J. T. Cade
Railway-tie....S. C. Caperton
Railway-tie, Metallic....F. H. Kinney
Railway-vehicle brake....J. E. Schumacher
Rat-trap....G. Duffek
Recording mechanism....W. H. Pike, Jr
Relay....L. H. Thullen
Relay....S. Cabot
Remedy, Topical....R. von Foregger
Retort-charging apparatus....J. A. Murphy
Reversible die....W. J. MacFarland et al
Road-bed-cutting apparatus....L. D. Craig
Rock-breaker, Subaqueous....C. L. Rowland (Reissue)
Rock-drill....B. Hastings
Rossing-machine....J. M. Baldwin
Rule-plant....J. T. Moyer
Safe-closing means....G. A. Hattersley
Sanding-machine....L. Lucas
Sash fastener, Window-....M. Rodney
Sash-lock, Window-....J. O. Hunt
Scale, Computing-....W. R. Mittendorf
Scale, Platform-....M. H. Winslow
Scoop, Excavating-....J. W. Page
Screens, Producing polychromatic....A. and L. Lumière
Screw-machine, Automatic....H. B. Lester
Scythe-fastening device....J. C. Mahan
Seat end....E. G. Budd
Seat or stool, Adjustable....A. J. Davis
Secondary battery....W. Morrison
Separator....R. Stein
Sewer-pipe cleaner....S. E. Barwis
Sewing-awl and combination-tool..T. Holmes
Shade trimmer, Extensible-....W. S. Waltz
Shaft-bearing oiler attachment....E. C. Dozier
Shelf, Adjustable extension-....B. C. Rowell
Shipping box or crate....C. Fessler
Shock-absorbing mechanism....E. J. Young
Shoe....E. Parent
Shovel-blade....H. K. Wood
Shovel, Excavating-....J. W. Page
Signaling....R. A. Fessenden
Silicon, Production of....G. O. Seward et al
Skein-lacing machine....C. Ferenbach
Smoke-consuming furnace....R. Boersig
Sound-reproducing-apparatus cabinet.O. G. Rose
Sound-reproducing instrument....O. G. Rose
Spark-plug....G. P. B. Hoyt
Spark-timer....H. W. Gabel
Speed-indicator, Self-timing....K. Weiss
Spinning-frame detachable implement....W. J. Willett
Splint-boxing machinery....A. B. Calkins
Spoon, Trolling-....G. W. Frey
Sprayer....H. A. Voelkner
Spring construction....W. R. Smith
Spring-motor....J. F. Armstrong
Spring-wheel....A. Carlson et al
Springs, Supporting and stretching device for woven-wire....S. W. Bennett
Spur....G. Kirby
Steam crab or winch....L. L. Tyrrell
Steam-siren....E. Hoenow
Steering mechanism....J. A. Scely
Sterilizing apparatus....J. Schoettl
Stock gripping and marking device....G. Deno
Stockings, Holder for mending....H. R. Graf
Stone, Artificial....C. A. Begle
Stove....S. Boal
Stove....G. W. Cope et al
Stove combined canopy and ventilator....J. P. Hahn
Stove-tray....W. C. and M. Bihler
Stringed instrument attachment, Picked....L. A. Williams
Stuffing-box....E. L. Mills
Switch-operating device....T. H. Lord
Switch-operating means....W. J. and O. J. Williams
Switch-point-throwing mechanism.G. F. Berray
Syrup, Refining....C. B. Duryea
Tag....G. H. Pierce
Tag....R. Kepner
Tag, Laundry-....G. A. Willard
Tank and spray pump....W. L. Deming
Tanning-machine....F. H. Yocum
Telegraph-key....F. W. De Tray
Telegraph-key....R. I. Leef
Telegraphy instrument, Combination wireless-..J. E. Ostrander
Telegraphy, Space....J. S. Stone
Telephone set, Substation....R. Hansen
Telephone-switchboard attachment.H. S. Janes
Telephonic recording apparatus.R. D. Lampson
Thermostatic motor....E. L. Hasley
Thin-place detector....T. J. McDaniel
Tie-plate....C. E. Shade
Tie-plate-....G. W. Whiteman et al
Tilt-table, Automatic traveling..J. W. Fonner
Tire....J. T. Carithers
Tire, Automobile-....B. R. G. Darré
Tire, Resilient....J. Guetton
Tire, Vehicle-....B. Ross
Tool, Button-cutting....N. Barry, Jr
Tool, Combination-....H. E. Shaul
Tool, Hand-controlled....C. B. Simmons
Tools, Fence-making attachment for combination-....T. Poese
Towel-rack....J. C. Burton
Toy....S. Bober
Tracker-bar....R. W. Pain
Traction-engine....D. Roberts et al
Trammel, Folding....C. O. Carrier
Transformer....H. F. Sellinger
Transmitter....R. Hansen
Transportation system....W. C. Carr
Trap....T. R. Culverhouse
Treadle mechanism....H. W. Loeder
Trousers-taking-off device....K. Vietor
Trousers....J. B. Morton
Truck, Locomotive-engine....C. H. Howard
Trunk....W. Hossfeld
Tube-bending device....E. J. Butler
Tug-fastener....L. C. Brady
Turbine....W. Fritz
Turbine pump or blower....H. A. Fee
Turbine, Steam-....J. C. Piper
Twine-cutter....A. J. Willetts
Turbines, Governing mechanism for elastic-fluid....S. Z. de Ferranti
Type-writer column-stop mechanism....T. L. Knapp et al
Type-writing machine....D. Briggs
Type-writing machine....E. B. Hess
Typographic machine, 2 pats..F. H. Richards
Upholstering device....F. H. Hampton et al
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Valve....J. J. Bettinger
Valve, Engine-....J. Rothchild
Valve-Float-....G. E. Loeble
Valve, Float-....L. Guedesse
Valve for regenerative furnaces, Reversing-...G. P. Graham
Valve, Sluice-....F. Seiffert
Valve, Steam-....J. D. Throop
Valve, Three-way....W. Adamson
Vehicle attachment....E. F. Brown
Vehicle axle, Motor-road-....L. Renault
Vehicle-wheel....J. E. Hallett
Vehicles and electromotive engines, Device for controlling air-brakes of railway-..J. M. Long
Velocity recorder, Detonating-..H. F. Mettegang
Vending-machine....H. V. Westervelt
Vending-apparatus....H. G. Hower et al
Vending machine, Stamp-....G. C. Barone
Ventilator....J. A. Pihl
Wagon-brake....A. J. Olson
Walls, ceilings, &c., Fastening device for slabs for....H. B. Copeland
Watch for counting the pulse by sound or touch....H. A. Lugrin
Water-coil....W. M. Taylor
Water-distilling apparatus....H. P. Snyder
Wave-motor....G. C. Hale
Weight for pickling-vats....C. G. Debiel
Wheel....M. J. and P. P. Adams
Wheel....A. Norrander
Wheel....A. Hanson
Whiffletree....G. F. Danielson
Whiffletree-hook....W. O. H. Bergman
Whip-lock....W. E. Roberts
Wick-trimmer....W. J. Lee
Winding-machine knotter, Cop-...S. J. Martin
Window-blind....G. P. Mitchell
Window-cleaning device....H. G. Vaughan
Window-protector....J. M. Triggs
Window-stiles, Machine for cutting.E. L.Ziegler
Wiper....A. Moseke
Wire-connector....A. T. Ballenger
Wire screen....H. T. Bittlinger et al
Work box....R. F. Paden
Wrench....W. M. Meck
Wrench....W. Van Wie
Wrench....R. O. Warren
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Wrench, 2 pats....H. Jeffrey

DESIGNS.

Badge....M. Wojtecki
Bank, Toy savings....H. Marlow
Brush, Shaving-....J. L. Erskine
Jar, Preserving-....W. R. Passano
Padlock....C. L. Ledin
Vessel....C. A. Blanchard

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Acid and glauber salt, Making phosphoric....E. H. Stickler
Adding-machine ribbon feeding and reversing mechanism....W. Callam
Advertising apparatus, Automatic movable....F. Giroud
Advertising device....H. V. Good
Advertising device, Automatic display....H. Hake
Agricultural implement....L. Battyany
Air-brake system....G. Macloskie
Air-drier for pneumatic lines..J. L. Lamb et al
Air-engine....C. J. Lake
Air tempering and purifying apparatus....W. F. Taylor
Air-ship....H. Wells
Alternator, Single-phase....C. P. Steinmetz
Aluminum-foil, Manufacturing of..A. Gautschi
Amusement device....H. L. Conwell
Armature-teeth, Ventilating-support for....T. Hibbard
Automobile-alarm....E. Copleston
Automobile disappearing luggage-carrier....E. T. Robinson
Automobile, &c., starting apparatus.S. J. Evans
Automobile-support....A. J. Parker
Bag-fastener....A. T. Hamilton
Bandage and dressing, Combined....H. Wilson
Bank, Savings-....A. Shepard
Barrel-blank-making machine....J. C. Palmer
Base-ball....G. A. Reach
Basin....W. A. Bloom
Baskets, Reversible cover-fastening device for....D. P. Moore
Bath-tub spraying attachment..R. R. Sandham
Battery cell, Dry-....W. S. Doe
Bearing, Hub-....H. L. Hannaford
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Bedstead, &c....J. A. Crane
Bell, Automatic call-....A. C. Mellinger
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Binder, Loose-leaf....O. R. Mayer
Binder, Publication-....E. B. Arnold
Binder, Publication-....A. M. Sonnichsen
Blanket and sleeping-bag, Combined.E. Benger
Binder-closer....E. Johnson
Block-machine, Centrifugal....M. Nashold (Reissue)
Blood-pressure measuring and indicating apparatus....F. A. Faught
Blue-flame burner....H. Hurwitz et al
Boats, Outside shaft-bearing and stuffing-box for....G. S. Spencer
Boiler-cleaner....P. Voorhees
Boiler-cleaning device....A. Thomas et al
Bolt-breaking machine, Stay-....H. L. Hahn
Bolt-lock, Panic....H. G. Voight
Boot and shoe elastic heel....C. M. Jaggers
Bottle....R. L. Sanders
Bottle and stopper therefor....G. Sparano
Bottle-cap....H. R. Vanaman
Bottle-capping machine....J. A. McAnulty
Bottle case, Milk-....H. E. Sanders
Bottle-filling apparatus....H. E. Sanders
Bottle-stopper....G. H. Newey
Box coupling, Junction....E. S. Morrell
Braiding-machine....W. N. Edwards
Bread-pans....J. E. Leamon
Breast-drill....G. O. Leopold
Brick-cutting machine....J. O. Ludlam et al
Brick-machine, Multimolding two-side-delivery hand....F. H. Folden
Brick masonry, Reinforced....N. Illoy
Broom-cover....C. Plunkett
Broom dust-collecting attachment.C. C. Abbott
Brush-holder....C. R. Whitney
Brush-holder....A. J. Brown
Bucket, Clam-shell....E. F. Atherton
Bunching-machine....C. L. Coombs
Burner....F. A. Curtis
Butter-fat from milk, Apparatus for extracting....H. D. Cooke et al
Button-making machine....S. Rembery
Cable choker-line, Log-hauling-....A. Opsal
Calculating-machine....L. D. Roberts
Camera....J. A. Robertson
Camera-focusing device....R. Krogel
Can-blank-forming machine..S. and C. H. Hookey
Can-tapping device....E. M. Early
Car automatic curtain hook and release, Vestibule-....J. McMullen
Car-axle lubricator....J. C. Nichol
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Car-bodies, Metallic end frame for...C. E. Dath
Car-brake-operating apparatus, Railway-....N. Elliott
Car-door mechanism....C. A. Lindström
Car draft-gear, Railway-....H. C. Buhoup
Car, Dumping-....F. Knott
Car-end construction, Passenger-....C. A. Lindström
Car-fender....F. C. Austin
Car lock and seal....L. MacKenzie
Car, Passenger-....H. Howson
Car, Railway-....S. Otis
Car, Railway-....E. T. Robinson
Car-roof....E. Posson
Car safety appliance, Railway-....R. Belden
Car-step....L. Yeager, Jr
Car stop, Automatic mine-....U. U. Carr
Car transfer, Street-....J. Samuels
Car-trolley....A. Zaccaria
Car-window sash-lock....W. M. Peach
Cars, Wheel-locking attachment for tram-....K. W. Daughdrill
Carbid or carbid-containing electrodes, Making e....H. S. Blackmor
Carbureter....B. N. Pierce
Carburetor....F. W. De Tray
Card holder, Postal-....O. W. Short
Carpet-sweeper....L. P. Halladay
Cartridge-loader, Safety....A. D. Otto
Casein, Separating....R. Head
Cement, Composition of matter for basing....D. Hand
Cement, Manufacture of hydraulic..C. J.Potter
Chafing-protector....A. H. Allen
Chain-stitch, Producing....J. Diem-Beutler
Check-holder....S. Liebman
Cheese-cutter....M. Huggins et al
Chuck....T. J. Fegley
Chuck....J. Lövenich
Cigar-box-lid holder....A. P. Ladd
Cinder-guard....H. S. Grimes et al
Circuit regulating device, Alternating-current-....S. R. Bergman
Circulating-system impelling device.E. P. Holly
Circulator....C. J. Watts
Cistern-cleaner....G. A. Stinger
Clamp....S. B. Derby
Clip for attaching springs to cross-bars....W. H. Bates
Clock, Program-....H. B. Wilson
Clock, Secondary electric....P. G. Giroud
Clock, Telephone-....A. Vonhausen
Clothes-drainer....A. O. Daniels
Clothes-line holder....G. Laube
Closet or privy....R. J. Farmer
Cloth-machine....C. Goldstein
Clothes-hanger....G. H. Wheary
Clothes-pin....E. B. Everett
Clutch mechanism, Friction-....E. R. Klemm
Coaster....J. A. Musgrove, Jr
Coin-controlled mechanism....J. L. Ferguson
Coins, tickets, admission-fees, &c., Receptacle for....W. Cox
Collapsible box....R. Ronconi (Reissue)
Comb for straightening hair, Ironing-....E. H. Taylor
Combustion-producing apparatus, Complete-...J. Cartin
Concrete-molding apparatus....J. F. Ross
Concrete-molding implement....J. F. Ross
Conduit-threading machine....H. W. Boddy
Conduits, Base for supporting switches and the like upon....G. A. Lutz
Conduits, Means for holding receptacles and the like to....G. A. Lutz
Conduits, Receptacles or the like for....G. A. Lutz et al
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Conveyer....J. H. and D. H. Magdill
Cooker, Fireless, 2 pats....A. T. Hallock
Cooking utensil....A. E. Conner
Core for molds, Expansible....P. C. Merillat
Corer....F. C. Roberts
Cork-cutting machine....B. Lauer
Corn-grader....A. S. Beymer
Corn-husker....H. S. Blair
Cotton-chopper....F. Abrams
Cotton chopper and cultivator, Combined....G. A. Krueger
Cotton-cleaner....S. Williams
Cotton crusher and separator, Snap....W. R. Lamb
Crate....W. F. Brown
Crate, Collapsible....J. G. Bryon
Cross-tie....J. J. Ross
Cruller-making machine....H. J. Gerdes
Cultivator....J. R Donnenworth
Cultivator and like machine....S. N. Hench
Culvert-fastener....C. E. Gilbert
Curling-iron....A. H. Gemmell
Curtain-pole....W. McCabe
Curtain-pole....G. H. Foulks
Cuspidor....L. C. Snyder
Cutter....M. S. Shapleigh
Cutting implement....A. J. Callaghan
Deck-plate, &....W. J.
Decorative [illegible] exhibiting....J.
Defrosting [illegible] Machine for....
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Dish-pan and drain, Combination-....
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Ditching machine....C. J.
Door catch and lock....
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Door fastener, Sliding-....J.
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Door-operating mechanism....C. J.
Door-operating device....J. F.
Doubletree, Four-horse....C. A.
Doubling and twisting machine thread-[illegible] attachment....F. S. Culver
Dough-molding apparatus....J. Callow
Draft apparatus....J. F. Stoeller
Drapery or curtain pole fixture.W. I. Heinrichs
Drawer guide and stop....A. W. Green et al
Drill-brace....J. S. Glenn
Drilling-machine....J. Petrie
Drilling stay-bolts and similar work, Machine for....J. A. Eder, Jr
Dry battery....C. D. Enochs
Dyeing-machine reversing mechanism....G. E. Drum et al
Egg-whisker and cake-mixer....M. W. Hall
Electric-circuit switch....E. B. Wedmore
Electric-conductor coupling....A. H. Conway
Electric-conductor envelop, Vapor-....E. Weintraub
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Electric heater....R. L. Hailey
Electric heating apparatus....G. Teuber
Electric heating devices, Apparatus for....F. Bölling
Electric-machine brush-support, Dynamo-....W. M. Coffman
Electric machine, Dynamo-....L. A. Tirrill
Electric machine, Dynamo-....A. H. Wouters
Electric-motor field-spool....E. H. Anderson
Electric switch....W. Drake et al
Electric transformer-furnace....O. Frick
Electrical apparatus and method of manufacturing and operating the same....J. T. H. Dempster
Electrode for search-lights....H. Viertel
Elevator-door latch....J. H. Stewart
Embriodery-stiletto....C. M. Haynes
Emergency-brake....J. Hauser
Engine air-heater, Gasolene-....C. B. Chambers
Engine cooling system, Internal-combustion-...C. C. Worthington
Envelop....E. L. and E. B. Von Eschen
Envelop....G. P. Skinner
Envelop....J. Korpatch
Envelop, Safety-....F. Aubrey
Eraser-holder for pencils, Attachable....A. F. W. Bowen
Explosive-engine....L. T. Bassett
Explosive-engine, Rotary....C. Sella
Fan system of heating, Automatic...C. C. Peck
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Farming implement....D. A. Ruffin
Fastening device....F. S. Carr
Fastening device and fence-post, Combined....I. L. Sales
Faucet....O. Warnock
Feed-bag....R. J. Brooks
Feed-obtaining apparatus, Measured-....J. A. Swindell
Feed-trip mechanism, Automatic...C. L. Libby
Feed-trough and exercising device for fowls..G. M. Link
Fence....L. S. Lachman
Fence-post....W. O. Kyle
Fence, Wire....L. S. Lachman
Fender....M. Hausle
Fertilizer-dropper, Hand....J. T. Flippen
File, Card-....E. Strassel
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Fire-alarm box, Automatic....H. Anderson
Fire-alarm signal system....B. B. Hatch
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Firearm safety device....C. J. Ehbets
Flag....W. G. Bell
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Fluid-motor....E. J. Firth
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Fluid-pressure controller....W. G. Hughes
Flush-tank....W. M. Baker
Flushometer....L. R. Hurst
Fly-trap....W. E. Criderman
Flying-machine....M. G. Adams
Folding chair....J. P. Reinhart
Foot-rest....F. C. Tate
Force-feed lubricator....W. H. Gamble
Formic-aldehyde-containing composition and making the same....H. S. Blackmore
Fraud-preventing device....G. A. Long
Friction device....L. Whitcomb
Fruit-clipper....C. N. Johnson
Fuel burner, Gaseous-....A. H. Bernhard
Fumigator....L. S. Livingstone
Funnel....G. A. Hanly
Furnace fume-arrester, Smelting-.H. S. Double
Furnace-grate....J. B. Bernhard
Furniture, Knockdown sectional....L. Faust
Game apparatus....F. H. Cook
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Game-table....J. M. Harrison
Garbage or ash receptacle.W. B. Pilkington et al
Garment-presser....N. Nelson
Gas-burner....J. M. Hare
Gas-cock, Safety....E. D. Booz
Gas-distributer....P. Bénard
Gas-fixture....A. Jarmolowsky
Gas-fixture safety device....J. G. Jambas et al
Gas-holder....F. H. Wagner
Gate....F. Wright
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Gate fastener, End-....F. P. Cudahy
Gate, Folding....H. M. Coomes
Gear, Short-turning running-....V. K. Kline
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Gearing for machine-tools..H. M. Darling et al
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Gearing, Transmission-.....E. E. Larson
Gearing, Transmission-.....C. E. Henroid
Grain and seed separator.....H. Möbus
Grain-cleaner.....G. R. Davidson
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Greaser, Griddle-.....E. F. Altman
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Hammer, Pneumatic.....J. Boyer
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Harrow, Disk.....W. C. King
Harvester, Corn-.....J. Hettrich
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Harvester shocker attachment....E. W. Fritz
Hat-fastener.....J. Stauber
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Hay-fork.....J. Melby
Head-covering.....L. Weiner
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.....C. H. Colby
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Hoe.....S. W. Shanks
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Hoist, Portable.....J. L. Pilling
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.....F. H. Wagner
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Hook-locking device.....P. B. Wohlrab
Horn, Amplifying-.....J. H. B. Conger
Horse-blanket.....W. Gordon
Horse-detacher.....G. W. Barnett
Horseshoe ice-creeper.....W. L. Ogden
Hose-coupling.....P. A. Walther
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Hydraulic motor.....H. Commandeer
Illuminating device.....C. A. Robinson
Illuminator.....H. L. De Zeng
Indicator.....W. Schmitzspan
Induction-motor.....J. B. Wirrd
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Ink-fountain.....J. C. Padgett
Ink-well.....J. W. Ferry
Insulator.....A. Weber, Jr
Insulator, Canopy-.....E. E. Bechtold
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.....E. Schmatolla
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Knockdown or foldable box....E. L. Walker
Label-supply mechanism.....F. O. Woodland
Lace corrodible groundwork.....R. Bauer
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Lamp.....F. A. Curtis
Lamp.....J. and G. G. Doorenbos
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Lathes, High-speed attachment for.....
.....G. W. Libby et al
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Lid-holder and indicator.....A. L. Bruzzéll
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Metal-coating apparatus.....H. Roberts
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Oil-can.....B. V. Chambers
Ore-separator, Centrifugal, 4 pats...P. F. Peck
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Oven, Baker's.....H. Hueg
Oven, Baking-.....E. Schmidt
Oven, Electric.....T. Van Aller
Oven-rack, Auxiliary.....F. A. Puffer
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Packing.....N. B. Miller
Packing-box.....J. Kelley
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Sidewalk-squeegee.....W. Mack
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Skirt gage and marker.....E. A. Howard
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Sleigh.....J. E. Hobbs
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Socket, Pull-.....J. R. Byrne
Sole and heel plate.....M. C. McCunn
Sole, tap, &c., holding rack....P. J. McGrath
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.....H. W. Ash
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Stove, Heating-.....J. A. Tynan (Reissue)
Stove or furnace grate.....J. A. Tynan
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Stringed and wind instrument music-rack....
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Stud.....C. W. Noble
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Surface-indicator.....W. A. James
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Switch mechanism.....L. B. Gamble
Switch-throwing device.....P. H. Petersen
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Tag-holder.....E. S. Coy
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Bottle holder, Nursing-.....D. D. Coombs
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Bottle, Vacuum-insulated.....G. P. Van Wye
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Box.....E. E. Flora
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Brooder.....G. H. Lee
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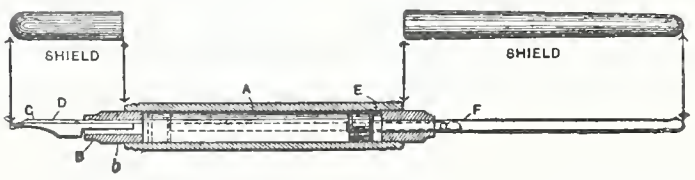
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NEW FOREIGN AEROPLANES.

By FRANK C. PERKINS.

FRENCH aeronauts are continually experimenting with new designs of aeroplanes, and during the past year this active work and the numerous trials have resulted in much valuable data. A number of successful flights have been made and several new types of aeroplanes are now being constructed.

The accompanying illustration (Fig. 1,) shows two engines for the Savage-Landor aeroplane, provided with metallic double blade propellers. Each of these engines has two cylinders of V-shape, constructed as noted in the photograph.

One of the latest aeroplanes is that of Gastambide and Mangin, Paris, aeronauts who have done much important work recently. This latest of French flying machines is of the monoplane type and is shown in the accompanying illustration (Fig. 2,) in flight, tipping to one side just before the accident at Bagatelle, after making a successful flight of several hundred feet. The aviator, M. Boyen, received no injury which was serious, but the aeroplane was badly demolished, the tail being broken off, the propeller damaged and the frame work broken, although the wings, which are built of strong wood with aluminum girders and steel strips, were not badly damaged.

The Gastambide-Mangin monoplane is equipped with wings having a spread of about thirty-three feet, the length of the body being about sixteen and a half feet. The total supporting surface is nearly 260 square feet, and the weight including the operator does not exceed nine hundred pounds. This aeroplane is equipped with an eight-cylinder motor of 50 horsepower capacity, placed at the forward end of the body and carrying a two-bladed propeller two yards in diameter and having a pitch a trifle over four feet.

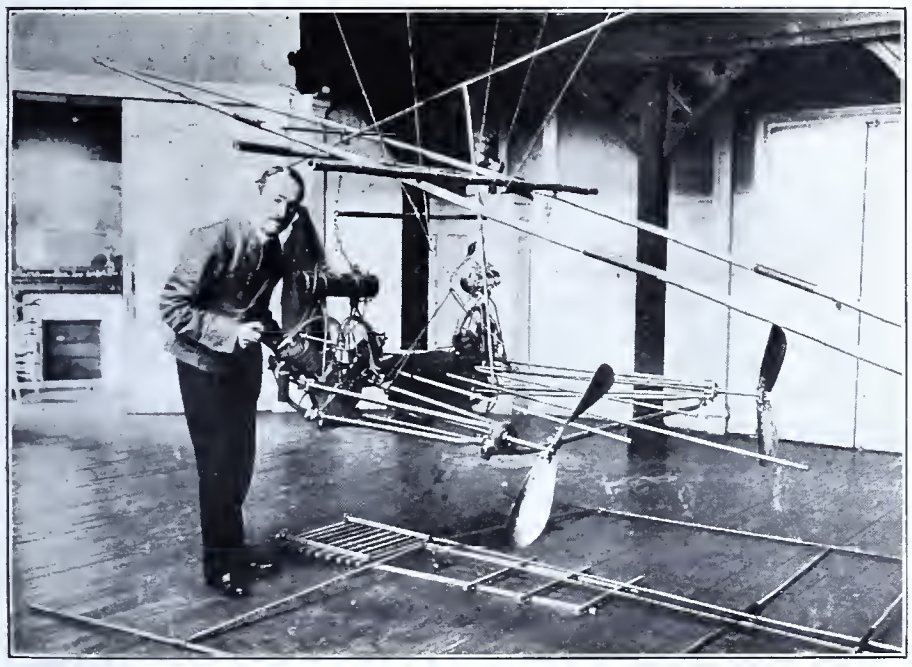


FIG. 1.—ENGINE FOR SAVAGE-LANDOR AEROPLANE



FIG. 2.—FRENCH MONOPLANE.



FIG. 3.—FARMAN IN THE PRIZE WINNING FLIGHT.

It will be noted by the illustration that the machine has a vertical rudder at the rear. No horizontal rudder was provided, as Messrs. Gastambide and Mangin held that the setting of the plane at a suitable angle upon the body was sufficient, and that the height of the aeroplane could be controlled by varying the speed of the motor. It is believed by many that the first test of this aeroplane and its wreck was simply a repetition of the experience of all other monoplanes which have been constructed and tested abroad. They maintain that these monoplanes are unstable and dangerous, and that the sudden dive and somersault of the machine was due to the fact that no balancing tail or horizontal rudder of any effective size was provided.

The Bleriet aeroplane, which also came to grief last winter, is a modified form of the Langley machine, weighing somewhat over nine hundred

pounds and having a single pair of wings with a spread of thirty-six feet, the rear planes being shortened and forming a horizontal rudder. The total supporting surface of this monoplane is 269 square feet. The horizontal rudder—formed of two planes, one on each side of the body—can be separately set at different angles to allow of making a turn, and a vertical rudder is provided between the planes.

One of the largest flying machine ever constructed in France is the new "Antoinette" aeroplane, built from Captain Ferber's designs, and having a total weight of over one thousand pounds. It is to have a motor of one hundred horsepower capacity placed in the frame work between the wings. This engine is of the sixteen cylinder V-type, and the aeronaut sits directly back of it in the frame work of the aeroplane, which consists of two large concave wings attached to the central body, the latter gradually tapering down to form a tail.

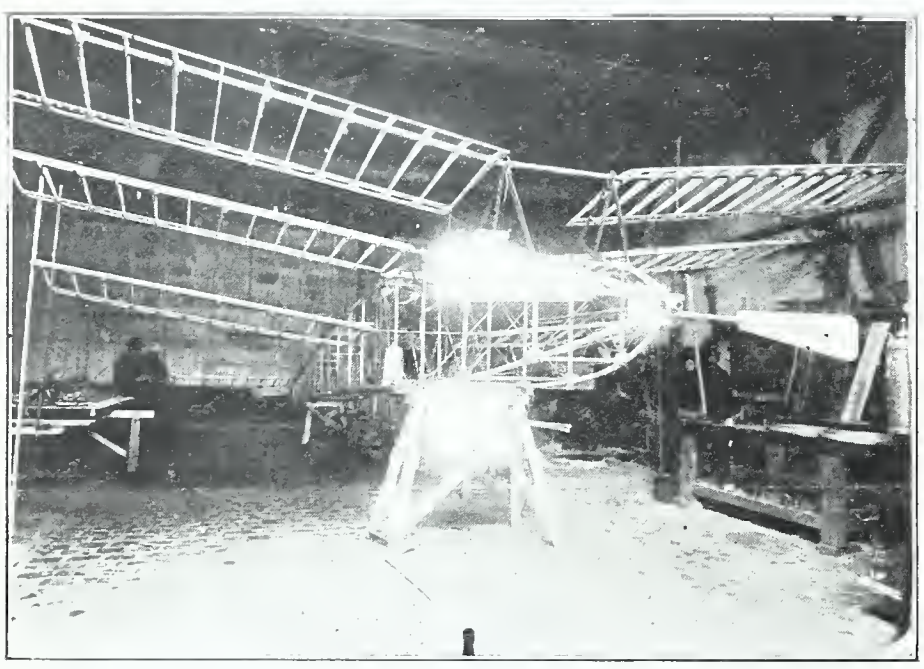


FIG. 4.—NEW FARMAN AEROPLANE

The most successful of aeroplanes made in France is that built by Voisin Brothers for Henry Farman, who is an English aeronaut doing valuable experimental work with flying machines in Paris.

The accompanying illustration (Fig. 3.) shows the Farman aeroplane equipped with a 50 horsepower gasoline motor of the Renault type. It consists of two main planes about six and a half feet wide and nearly forty feet in length, placed one above the other about six and a half feet apart. There are two other planes some fifteen feet behind the main planes, these being six and a half feet wide and ten feet long, forming a balancing tail. These short tail planes are connected together at each end by a pivoted vertical rudder. Each rudder is operated by lever arms connected to the steering column by rods. The total surface of the aeroplane is about six hundred and fifty square feet, and its weight nearly twelve hundred pounds, the load being two pounds per square foot. At the rear part of the lower forward plane the gasoline engine is located, carrying a two-bladed propeller on its crank shaft. The propeller blades are each of a pitch of about three and a half feet, and the diameter of the propeller is nearly seven feet. The engine is of the eight-cylinder type of French construction, the motor having a normal capacity of 50 horsepower. Farman has made over two hundred flights and landings successfully with this double surfaced aeroplane without any serious mishap. One of these flights won a prize of $10,000. This intrepid aviator has concluded to try a new form of flying machine, a view of which is given in Fig. 4. It is about 46 feet long, including a vertical rudder with three planes arranged in steps, having a total spread of twenty and one half feet. The rear plane has a spread of about fifteen and one-half feet and the total supporting surface is a trifle less than 260 square feet. The three pairs of main planes are not superposed but are single, and the rear plane acts as a horizontal rudder, being pivoted and connected with a proper steering gear. The machine weighs over 1400 pounds and has a surface capacity of about five and one-half pounds per square foot. An 8-cylinder gasoline motor of 80 horsepower will be employed, or else an air cooled motor of the Renault 8-cylinder type, having a capacity of 50 horsepower. It is believed that the machine will rise and attain a speed of fifty miles per hour. Many critics fear that while this aeroplane will not lack the stability of the older Farman machine, it will be more dangerous on account of the greater speed required for rising. The success of this aviator in his past remarkable preformances, however, creates confidence in his ability to operate his new type of aeroplane successfully.

Talking Postal Cards.

A novelty worthy of American ingenuity has been evolved by the acute brain of a French engineer, and has become so popular in his own country that the American patent rights have been secured and the device will soon be exhibited in cities on this side of the water. A person desiring to send a talking postal card to a friend enters a booth and talks into a graphophone, that records the words on a specially prepared postal card. When the friend receives the card, perhaps a thousand miles away, he takes the card to the nearest postal booth and inserts in a machine which talks the message it contains. The record on the card is indestructible, and the exact voice of the sender is heard.

To Signal Mars.

The proposal is made by so conservative a scientist as Prof. Pickering, of Harvard, that messages might be flashed to Mars when that planet approaches the earth this summer. It will come in July, within 35,000,000 miles or 5,000,000 miles nearer than ever before. His plan is to use a series of mirrors so arranged as to present a single reflecting surface over a quarter of a mile square. The mirrors would have to be attached to one great axis parallel to that of the earth and run by motors, planned so as to make a complete revolution every 24 hours, thus carying the reflecting surface around with the axis once a day. As might have been expected, the suggestion has met with approval and with ridicule. One of the most eminent of living astronomers, Camille Flammarion, says that communication with Mars is entirely within the bounds of possibility.

Our sister planet has long been the subject of research and of surmise on the part of the inhabitants of this globe. By means of the telescope and the camera, it has been established that it enjoys an atmosphere, although it is probably very thin, and supports forms of life, if any, very different from those that exist upon the earth. Mars turns on its axis, with days and nights much like our own in length and kind, and has seasons similar to ours though proportionally longer. Around the two poles are formations that are almost certainly composed of ice and snow, for as summer approaches they grow smaller and smaller, as if melting before the heat, to reappear with the return of winter. Then the famous canals, practically invisible during the cold season, become apparent, a complicated system of lines, the largest leading out from an area adjoining the polar regions, and traversing the globe in orderly complexity. The system has an artificial look, as if intelligence had much to do with its planning. Rarely do the lines deviate from a great circle on the planet's surface; their length is anywhere from 200 to 3000 miles; they join one another at various angles, somewhat like spokes in the hub of a wheel, or paths leading away from a public plaza. It is a network that appears as fine as a cobweb, and threads the planet over its summer hemisphere with a regularity that keeps pace with Mars' journeys around the sun. But still more remarkable was the discovery of the doubling of these canals. This doubling, of which science was at first skeptical, has now been established as an authenticated fact; for though the human eye may "see double," the camera is not liable to the same weakness. It makes the problem of what is happening on our neighbor still more puzzling. No reasonable explanation of this matter has been offered.

It must be admitted that the markings on Mars, the canals and the lakes or oases which are situated at intersections, present such an artificial effect as to justify the presumption that intelligent life must have accomplished such results. The theory most generally believed is that the canals are simply due to vegetation, nourished in summer by an extensive system of irrigation, elaborated to a vast extent, which dwellers on the earth have just begun to imitate. And if vegetation, why not animal life? It is not the kind of life fitted to earthly environment, but there is no reason why this should be the only variety in the universe. The vital principle, as exemplified in this world, is so persistent, so tenacious, that no one can generalize with certainty as to what is possible or impossible on another planet, from the small fraction which we have the opportunity of observing.

The Revival of the Water Wheel.

The deserted water wheel, moss grown and silent, has for years been a type of rural peace, and has of late become so rare that it has been sought for by lovers of the picturesque. But the signs indicate that the water wheel is again coming to its own. A marked revival in its use is seen everywhere, with the growing development of water power for electrical purposes. The invention of devices for conveying electricity to long distances from the waterfalls that run the dynamos has made old fashioned water power a successful rival of steam. On the Pacific Coast especially, where although the volume of streams is relatively light, the fall is tremendous, this movement has been marked. Here the water is conveyed in pipes—sometimes of only a few inches in diameter, but down so steep a descent as to cause enormous pressure to the square inch. This, thrown against that form of the turbine known as the "impulse wheel," sets it into extremely rapid motion, which is immediately applicable to a dynamo. Since the earthquake in San Francisco, that city has been getting its power from a distance of 200 miles. The waters of the Sierra Nevada mountains are thus brought to the very doors of the manufacturing plants of the coast. In the East, where the volume of streams is greater but the fall is comparatively slight, a slower turbine is used, which needs considerable gearing up to produce high speed.

Wireless Light.

Wireless telegraphy is no longer surprising a world accustomed to wonders, and wireless telephony has also come to be accepted without comment; but now we are to have wireless lighting. Science has long known that an electric current passing through a vacuum will produce a vivid light, and this knowledge is now to be utilized commercially. A rarified gas—nitrogen or carbon dioxide—is to be employed instead of an actual vacuum, and the illuminant is said to be superior to arc or incandescent lamps, and to be better distributed. A drawback to the system has resided in the fact that after the current has been passing through the tube for some time, the gas has apparently become absorbed, with a consequent lessening of the light. This obstacle has now been overcome by the use of an automatic valve, through which the tube may replenish its supply of gas from a reserve tank—the valve to be controlled by the pressure on the tube itself.

A MAGIC WELDING PROCESS.

By Frank C. Perkins.

In places remote from large foundries and other manufacturing plants serious difficulties are met with in making repairs to stationary engines, marine engines and mining machinery. A remedy for this condition has been found in a remarkable welding process recently discovered by an eminent German engineer, whereby great steel shafts or forged castings may be repaired without loss of time and with very little expense. It is only necessary to prepare a mold, provide a small amount of the welding material, and ignite the same.

The compound used is known as thermit, and consists of a mixture of aluminum and iron oxide. Superheated liquid steel is produced as well as liquid slag or aluminum or oxide, the heat generated reaching the intense temperature of 5,400 degrees F., and less than thirty seconds is necessary for the reaction. The superheated liquid steel, it will be seen, possesses double the temperature of ordinary molten steel. It may be poured into a mold surrounding broken sections of steel or cast iron, and when cooled the thermit steel will be found fused into one homogeneous mass with the broken parts, making a complete repair.

The actual method of making welds on steel sections is simple. The following description applies to heavy ordnance as well as to other classes of repair, the method of procedure being essentially the same for all. The fracture should first be opened up by drilling a series of holes along the line of the break, or the metal may be cut away by any convenient method, the object being to provide a space for the free flow of thermit steel between the parts to be welded. The fracture should then be surrounded with a mold of the type shown in Fig. 1, or Fig. 2, according to conditions. The principle guiding in the construction of the mold is that the thermit steel must run through a gate to the lowest point of the mold and rise through, and around, the parts to be welded.

The gate should not allow the thermit steel to impinge directly upon the casting. The mold must allow a band or collar of thermit to be cast around the defective parts or the ends of the pieces to be welded. The thermit flowing through this space in the mold will dissolve the metal with which it comes in contact and amalgamate with it, adding to the strength of the original casting. In cases where the break have occurred through weakness in the casting, it acts as a reinforcement and should not be machined off.

The shape of this band or collar should resemble, in cross section, approximately the segment of a circle, the thickest part being directly over the fracture and sloping off gradually to the edges. It should overlap the edges of the fracture at least one inch. The thicker the metal to be repaired, the thicker must be the band of thermit, and the dimensions in general must make allowance for the nature of the repair. The pattern of the part to be repaired, with the reinforcing band around it, is first made, and from this a mold is constructed.



Fig. 1.—Showing the finished weld on a Mississippi steamer.

In the construction of the pattern, the thermit process represents one of the most important steps forward, especially in its application to military requirements. It would obviously be extremely difficult, to construct wooden patterns in the field, and the making of such patterns is a slow and expensive operation at best. The method recommended therefore, is to use yellow wax as a matrix. The parts to be welded are first laid together and a wax pattern of the exact form desired in the final weld shaped about them. After this is done, the molding sand, which consists of fireclay and sand, is tramped around the matrix in the usual manner, except that a small hole is left at the very lowest part of the mold.

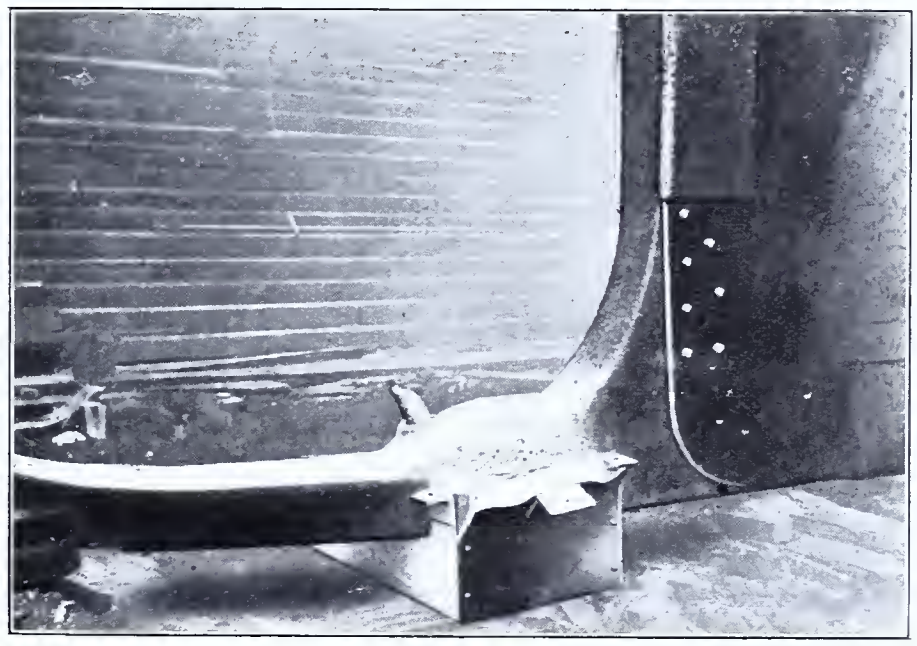


Fig. 2.—Showing the weld with the mold at the New London Marine Iron Works.

It is maintained that the patterns for runner and riser are best made of wood. Their volume should equal that of the collar which is cast around the fracture, as the first steel running out of the crucible into the mold becomes chilled when coming in contact with the casting, which, even when preheated, has a considerably lower temperature than the thermit. This chilling effect can only be overcome by a sufficient quantity of thermit steel, so that the chilled portion is driven up into the riser and is replaced in the reinforcement by metal which has practically the full temperature it receives during the reaction.

After the mold box is placed in position and completely filled, the wooden runner and riser are withdrawn. Then, instead of taking off the mold and drying it, a torch is directed into the riser, directly on the green sand. The heat melts the wax, which runs out of the hole at the bottom. The heating is continued until the mold is thoroughly dried and the parts to be welded are brought to a bright red heat, when the hole at the bottom can be closed with a sand core and backed with a little sand, and the mold is ready for casting. In case a wooden pattern is used and the mold made and dried in the ordinary manner, the joints of the mold box should be sealed with a little fire-clay to avoid leakage. Asbestos wick may also be used for this purpose. Particular care should be taken to make the mold strong enough to withstand the weight and scouring action of the superheated thermit steel.

Dr Goldschmidt, the inventor of the new process, recommends an additional two per cent of manganese and holds that it is quite possible, and often advisable, to introduce small quantities of manganese, nickel, chromium, vanadium or other metals into the thermit steel in making certain classes of repairs.

A cone shaped, magnesia-lined, crucible is used for the thermit reaction. It is plugged and tapped in a very ingenious manner, and is closed at the bottom by a scarfed pin suspended in the opening, so that its lower end projects about two inches below the crucible. Over this are placed asbestos washers, and a round metal disk. These are rammed firmly into place, and a layer of refractory sand is placed on top. The welding operation is simple: the thermit powder is poured into the crucible and in the middle is placed a pinch of ignition powder. This may be ignited by applying a small bundle of parlor matches immediately after they have been struck. By this the chemical reaction is started and spreads through the rest of the mass. The resulting superheated liquid steel sinks to the bottom of the crucible, whence it is tapped into the mold by giving the tapping pin a sharp knock upwards, and the liquid thermit runs directly into the gate of the mold. Care should be taken to neutralize as much as possible the strain caused by the contraction of the liquid metal while cooling, this being done by heating and expanding the surrounding parts previous to welding. In the operations described, one of the chief features is this preheating of the sections to be welded. This is of great importance, as if the sections are not thoroughly preheated they will chill the thermit and greatly interfere with the welding. Sections cast without preheating are likely to contain blow-holes, while if the mold is thoroughly dry and the sections brought to a red heat, the most perfect welds will result.

Thermit played an important part in the Russian–Japanese war, particularly on the Russian side. After the first attack of the Japanese on the Port Arthur fleet, several tons were obtained by the Russian goverment, and it is claimed that the remarkably speedy repairs effected were due to thermit welds. The Japanese have also used thermit, but before the war it was less known there than in Russia. In far off countries thermit is now in constant use, although no experienced mechanics are available, and engineers have to teach themselves by following the instructions. It is just in such countries however, where machinery is difficult to obtain, that thermit is of inestimable value.

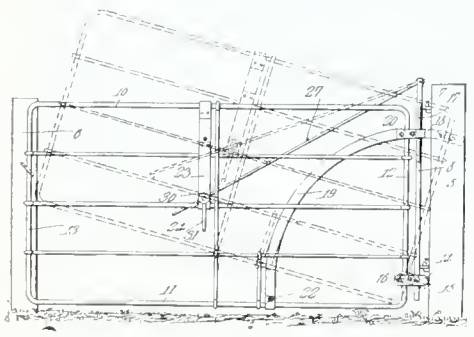
By means of this magic welding process spare castings can be made at once out of thermit steel, while, as already pointed out, repairs of great magnitude are entirely feasible, which before this wonderful discovery of Doctor Goldschmidt would have been absolutely impossible. In the accompanying illustrations, Fig. 1 shows the finished weld on the stern wheel shaft of a Mississippi River steamer. This repair was made without this steamer missing a single trip. Fig. 2 shows a weld, with the mold after welding the stern post on a steam-ship at the New London Marine Iron works.

CLEVER NEW PATENTS.

Gate.—Grain Cleaner.—Rule Clamp.—Dish Pan and Drain.

Gate.

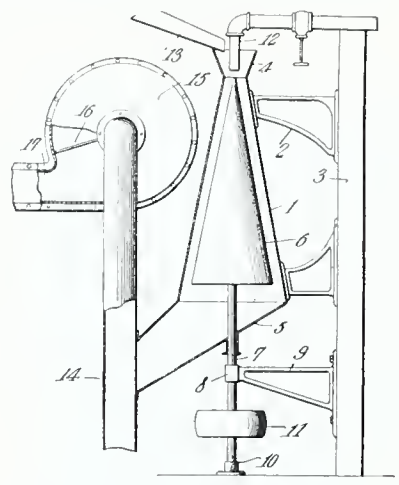
A gate that will permit the passage of small stock such as pigs and sheep, and yet bar the progress of cattle and horses from field to field, is a long-felt want on the farm. A recent patent, taken out by Daniel Fasold, of Keswick, Iowa, supplies this need, and also provides a device so constructed that it may be swung horizontally, like an ordinary gate, or may be swung vertically and held at various adjustments, or may be bodily adjusted vertically, to permit it to swing over irregularities in the road, such as snow drifts and other obstructions. Means are also provided for holding the gate, when in lowered position, against being swung vertically through the efforts of small stock to crawl underneath. As shown in the cut, a hinge bar 8 is used in supporting the gate from the post 7, and a plate 14 is secured on the lower end of



the bar, and bolted to this plate is another plate 16; and between the securing bolts is received the end bar 12 of the gate frame. A guide 17 is fixed upon the hinge bar and is received loosely in an offset bearing 18, formed at the upper end of an arcuate guide bar 19, the end bar of the gate frame being connected also to said end of the arcuate bar by a plate 20, bolted to the bar 19, the end bar of the gate being confined in said offset 18 of the bar, the plate 20 and the bolts 21, as is the case of the plates 14 and 16 and the securing bolts therefor: it being understood that by loosening these bolts, the gate may be bodily adjusted vertically, and the bolts then tightened to hold it in adjusted position. In other words, the gate may be adjusted to bring its bottom bar 11 at various elevations about the road, so as to permit the swinging of the gate above a snow drift, or over irregularities or obstructions in the road. The lower end of the arcuate bar 19 is bent back upon itself as at 22, and embraces the bottom bar of the gate, it being understood that when the gate is in its normal position, it will be firmly supported by pivotal connection with the hinge bar 8, and by engagement of the offset bearing portion 18 with the guide 17. But when the gate is swung vertically upon its pivot 15, the bar 19 will move through the guide. A bearing plate 23 is fixed upon the gate frame, and through this passes a stem which is threaded, except adjacent to one end, where it has an opening through which slides a rod 27 pivoted at its upper end to the hinge bar 8. A washer is engaged upon the stem between the bar and the plate, and threaded on the stem is a collar carrying a crank handle 31, by which the collar may be rotated. When rotated in one direction, the stem will be fed in the direction of its length, and will bind the rod 27 against the washer. It will be seen that by rotating the crank handle, the rod 27 will be released and the gate may be swung vertically upon its pivot to the desired position, after which the handle may be turned in a reverse direction to hold the gate in adjusted position.

Grain Cleaner.

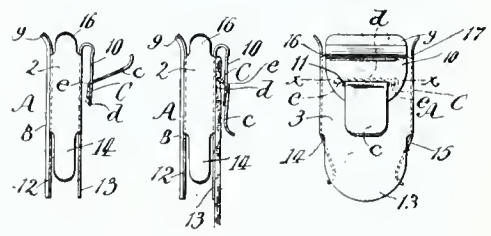
A simple and advantageous device for use in treating grain has been invented by George R. Davidson, of Lenox, Michigan. It is adapted for employment in cleaning, scouring, polishing, peeling and pulverizing grain, and consists, in general, of a conical beater journaled for rotation, and surrounded by a conical or other form of casing, 1, spaced from the same. The said casing is provided at one end with a hopper or inlet, 4, for the grain. An air pipe 12, adapted to discharge compressed air against the end of the beater, terminates in the said hopper, and the outlet of the pipe is in alinement with the longitudinal axis of the beater. The casing is provided with a chute 5 which discharges into a vertically disposed pipe 14, and a fan 16 is connected with this pipe and is adapted to create suction through the same for the purpose of removing the refuse matter which has been separated from the grain kernels. It will be seen that when the grain is introduced into the casing, it is forced into contact with the beater by a blast of air or gas, the force of which causes it to rebound between the beater and the inner side of the casing. Thus the



outer skin or paricarp of the seed is subjected to the force of impact against the sides of the beater and the casing, and is eventually cracked and removed from the grain. Furthermore, as the beater is rotating, the grain is turned so that all sides are presented to the beater and inner surface of the casing during a passage of the same through the said casing. After the outer skin of the grain is cracked, it is separated from the grain by the same action and thus the skin and the undesirable foreign matter located thereon is removed from the grain kernels. When the material enters the chute 5 it passes into the pipe 14, and as the fan rotates, a suction is created which draws the hulls up, to be discharged through the outlet 17, while the grain kernels fall down through the pipe 14.

Rule Clamp.

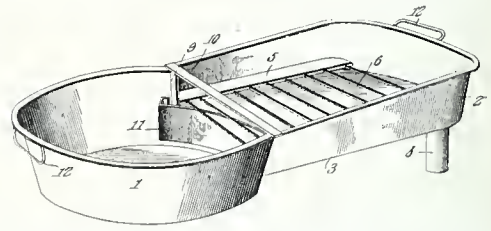
A simple and handy clamp for holding elongated objects, the special application being the retention of a folded measuring rule in such a manner that a carpenter may always have it ready for use, has been invented by J. T. Moyer, of Milford Square, Pa. The object is to provide a device adapted to clamp the rule so as not to scratch or mar the faces thereof which contain the scale, and which is inexpensive and durable. The implement embodies a rectangular box 2, formed of a block of resilient sheet metal, the free edges of two sections forming a joint and overlapping one another so as to add rigidity to the structure. Extended upward from the front wall is a slightly curved flange 9, and extended upward and then downward from the rear wall is a tongue 10, provided with a slot 11. A tongue 12 depends from the lower end of the front wall, and a similar tongue is located opposite thereto on



the lower end of the rear wall 3. These tongues are perfectly flat and smooth for contact with the marked faces of the rule without liability of marring the same. On the lower end of the side wall 2 is an inwardly bowed clamping jaw 14, and a similar jaw 15 extends from the opposite wall, these jaws being adapted for frictional contact with the reinforced edges of the rule, for clamping the same within the device. The side walls are also provided with outwardly curved flanges 16 and 17. It will be seen that the flange 9, in conjunction with the connecting loop of the tongue 10, and the side flanges 16 and 17, forms a mouth to facilitate the introduction of objects into the device from the top, whereby such objects may readily be introduced into the box and thence forced between the jaws without scratching the faces of the rule. A flat bar C is located on the tongue 10, having a lever *c* extended therefrom and through the slot 11. This bar C has a sharp toothed inner edge *d*, and its outer edge parts *e* form shoulders to bear on the inner surface of the tongue, so that when swinging the bar the tongue may be forced outward to admit of a piece of fabric being tightly clamped against the wall, as shown in the central cut. In using the invention, the bar 5 is placed as shown in the figure to the left, when the device is to be clamped over the edge of the rule pocket, the tongue 10 being outside, so that the rule may be held in the pocket and not fall out when the artisan stoops over. Then the lever C is moved into position as shown in the next cut, which drives the toothed edge of the bar against the fabric and secures the device. But the tongue 10 may also be placed back of the upper edge part of any pocket, or of a belt, whereby said part is clamped between the tongue 10 and the rear wall of the box, and the device is held in position by means of the bar C which presses into the fabric. It may be removed by swinging the lever back into the position shown in the first figure. A rule can be inserted or removed either from the top or bottom, the bowed parts of the jaws securely clamping it in place.

Dish Pan and Drain.

Any device that lessens the monotony of domestic labor will be welcomed by housewives throughout the country, and an apparatus recently patented by Ammi Fike, of Newton, Kansas, has many advantages in simplicity and efficiency. It consists of a combined washing pan, draining trough and draining rack. As seen in the annexed illustration, the trough extends from the dish pan and is designed to discharge into the same, legs 8 serving to support the trough in an inclined position. The draining rack has side members 5 united by slats 6, the side members being disposed along the side walls of the trough, and the rack being spaced from the bottom by legs. In order to prevent the rack from sliding into the wash pan, shoulders 9 project from the side walls of the trough to receive the terminals of the side members 5.



Mounted on the upper edge of the trough is a straight rest bar 10. A baffle plate 11 is mounted on the wall of the dish pan and extends slightly above the bottom of the trough. It is spaced far enough from the side wall to permit a rag to be introduced for cleaning purposes. The walls of the dish pan are entirely cut away within the contour of the trough, which permits the device to be readily cleaned. The common practice has been to allow part of the wall of the pan to remain intact between the side walls of the trough, to form a support for the dishes. This practice has the disadvantage that the dishes resting against the wall tend to follow its curve, until they touch the side walls of the trough, in which position they extend beyond the walls of the device, and the dish water drips out on the table. The straight rest bar obviates this drawback. The baffle plate 11 receives the cold drip from the dishes draining in the rack, and also receives the hot rinsing water which is frequently poured over the dishes so mounted, and diverts the same to the bottom of the pan.

PATENTS, CAVEATS, TRADE-MARKS, COPYRIGHTS, AND DESIGNS. TWENTY-FIVE YEARS PRACTICE.

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LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

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NATIONAL RECORDING SAFE CO. v. INTERNATIONAL SAFE CO. et al.

(Circuit Court, N. D. Illinois, E. D. Jan. 24, 1908. 158 F. R. p. 824.)

1. PATENTS—INFRINGEMENT BY PATENTEE—ESTOPPEL BY ASSIGNMENT.

Where a patentee who has assigned his patent organizes and controls a corporation which is charged with infringement, it is estopped to the same extent that he would be to deny the validity of the patent, or to invoke the prior art to limit its claims, as made and allowed, and outside evidence is admissible only where the language is ambiguous to make clear what the applicant meant to claim and the government to allow.

2. SAME — INFRINGEMENT—PORTABLE SAVINGS BANK.

The Fisher patent No. 793,779 for a portable savings bank, construed in the light of the contents of the file wrapper, held not so clearly infringed as to warrant the granting of a preliminary injunction.

AMERICAN WINE CO. v. KOHLMAN et al.

(Circuit Court, S. D. Alabama, Fifth Circuit. Dec. 11, 1907. 158 F. R. p. 830.)

TRADE-MARKS AND TRADE-NAMES—WORDS SUBJECT TO APPROPRIATION—"AMERICAN."

The "American Wine Company" cannot be exclusively appropriated as a trade-mark or trade-name, the word "American" being broadly geographical, and its use as a name by a second corporation is not an infringement of trade-mark rights of a prior user, nor does it constitute unfair competition unless it is used fraudulently with the intent and the effect of deceiving the public to the injury of the first user.

AMERICAN STOVE CO. v. CLEVELAND FOUNDRY CO. et al. DANGLER STOVE & MFG. CO. v. SAME.

(Circuit Court of Appeals, Sixth Circuit. Jan. 22, 1908. 158 F. R. p. 978.)

1. PATENTS—INFRINGEMENT—OIL BURNERS.

The Jeavons patent No. 475,401, for an oil burner, claim 1, was not anticipated, and construed in the light of the specification and drawings is valid for the apparatus therein described, the essential feature of which is "a vapor holder constructed for the free and uniform distribution of the vapor therein by gravity," the dominating idea of the invention being to vaporize the liquid used on its entrance into the vapor holder by the heat of the metal, and to cause the vapor to flow around the burner in a trough by gravity. The invention is not a pioneer one, however, and the patent must be limited in construction to substantially the means described. As so construed, it is not infringed by a burner in which the trough contains a circular flat asbestos wick standing vertically which carries up the oil from the trough; vaporization and combustion, in part, taking place at its upper edge.

2. SAME-CONSTRUCTION OF CLAIMS-LIMITATION BY PROCEEDINGS IN PATENT OFFICE.

An applicant for a patent, who trims away, modifies, and otherwise defines his specification and claims to meet references made by the Patent Office, must be deemed to have surrendered and disclaimed what he conceded, and to have imposed such definitions upon the language of the patent as he attributed to it in order to secure the grant.

PRUDENTIAL INS. CO v. WESTINGHOUSE ELECTRIC & MFG. CO.

(Circuit Court of Appeals, Third Circuit. February 6, 1908. 158 F. R. p. 985.)

PATENTS— INVENTION AND INFRINGEMENT—FASTENING MEANS FOR CORE-PLATES.

The Nolan patent, No. 582,481, for fastening means for core-plates of electrical machines, claims 2 and 4, disclose invention, and are valid. Also held infringed.

WESTINGHOUSE ELECTRIC & MFG. CO. v. PRUDENTIAL INS. CO.

(Circuit Court of Appeals, Third Circuit. Feb. 6, 1907. 158 F. R. p. 987.)

PATENTS—NOVELTY-FASTENING MEANS FOR CORE-PLATES.

The Nolan patent, No. 582,481, for fastening means for core-plates of electrical machines, claims 1 and 3, which do not include as an element a shoulder on the annular plates for holding the spring-ring in its groove, which constitutes the gist of the invention as disclosed in the other claims, are void for lack of patentable novelty.

FRANK F. SLOCOMB & CO. Inc., v. TURNER.

(Circuit Court, E. D. Pennsylvania. Jan. 29, 1908. 158 F. R. p. 987.)

PATENTS—INFRINGEMENT — MACHINES FOR FINISHING LEATHER.

The Anderson patent, No 457,331, the Pierce & Poinsett patent, No. 623,423, and the Holmes patent, No. 538,914, all relating to staking machines in the art of finishing leather, held infringed by the machine of the Scott patent, No. 819,605.

BEECHAM v. JACOBS.

(Circuit Court of Appeals, Second Circuit. Jan. 7, 1908. 159 F. R. p. 129.)

1. TRADE-MARKS — INFRINGEMENT —RIGHT TO RELIEF—DECEPTION—"PATENT."

Where complainant sold pills that were not patented under the name "Beecham's Patent Pills." the word "patent" was employed in a mere proprietary sense, to indicate that the pills were made according to Beecham's secret formula, and not necessarily that they were manufactured under letters patent, and hence did not constitute such a misrepresentation as to preclude plaintiff from relief in equity against the infringement of plaintiff's trade-mark, "Beecham's Pills."

2. SAME.

Where complainant in a suit to restrain infringement of a trade-mark, "Beecham's Pills," only represented in connection with the sale of the pills that they were prepared and sold by complainant in St. Helens, England, and in New York, a statement that "the pills accompanying this pamphlet are specially packed for U. S. America" was insufficient to show a misrepresentation that the pills were made in England, so as to preclude complainant from equitable relief.

JAMES E. TOMPKINS CO. v. NEW YORK WOVEN WIRE MATTRESS CO.

(Circuit Court of Appeals, Second Circuit. Jan. 7, 1907. 159 F. R. p. 133.)

1. PATENTS — INFRINGEMENT — DESIGN FOR BED SPRING.

The Tompkins design patent, No. 37,649, for a design for bed-springs, held either void for lack of patentability or not infringed on uncontradicted testimony that defendant made and sold springs in all essentials like those alleged to infringe before the application for the patent was filed.

2. SAME — DESIGNS — SUFFICIENCY OF DESCRIPTION.

A design patent like a mechanical patent must describe the article in such full, clear, concise. and exact terms as to enable persons skilled in the art to make and use the invention.

J. L. MOTT IRON WORKS v. STANDARD SANITARY MFG. CO.

(Circuit Court of Appeals, Third Circuit. Feb. 6, 1908. 159 F. R. p. 135.)

1. PATENTS—INVENTION—DREDGER FOR ENAMELING.

The Arrott patent, No. 633,941, for a dredger for pulverulent material used in enameling bath tubs, etc., was not anticipated, and discloses invention, the device being one of a high order of merit and usefulness. Also held infringed.

2. SAME.

The contributiou to an important industry of a device that is labor-saving and effective, and relieves to a degree work under fierce heat conditions, is meritorious in the patent system, and rises to the plane of the humane.

GRAY v. GRINBERG et al.

(Circuit Court of Appeals, Third Circuit. Feb. 5, 1908. 159 F. R. p. 138.)

PATENTS—SUIT FOR INFRINGEMENT—ISSUES MADE BY PLEADINGS

Where a bill for infringement of a patent against a nonresident defendant alleged infringement in the district where the suit was brought, which allegation was denied in the answer, the issue as to infringement is limited to infringement within such district.

AMERICAN GRASS TWINE CO. v. CHOATE et al.

(Circuit Court of Appeals, Seventh Circuit. Nov. 15, 1907. 159 F. R. p. 140.)

1. PATENTS—INVENTION—GRASS TWINE.

The Lowry patent, No. 412,963, for a grass twine for use in harvesters to bind grain, consisting of a twine made of grass, hay, or straw twisted together and wrapped with a thread made of cotton or other suitable material, in view of the prior art, which disclosed both grass rope and the use of a wrapping of thread for twine made of coarse and brittle fibers, is void for lack of patentable invention.

2. SAME—GRASS FABRICS.

The Koeck patent, No. 646,123, for a fabric consisting of a main body portion formed of a parallel layers or strands of twisted grass, each wrapped with a thread and having transverse binding threads passing alternately over and under such grass strands to bind them together, is merely for the result of the application of the old method of weaving rag carpets to a different material, and is void for lack of invention.

MERRELL-SOULE CO. v. STAR CO.

(Circuit Court of Appeals, Second Circuit. Jan. 16, 1908. 159 F. R. p. 142.)

PATENS—INVENTION—MASK.

The Merrell patent, No. 727,173, for a mask made from a flat blank having interlocking devices of well-known forms at the top and bottom to hold it in place, is void for lack of invention.

CHICAGO PNEUMATIC TOOL CO. v. CLEVELAND PNEUMATIC TOOL CO.

(Circuit Court of Appeals, Third Circuit. Feb. 5, 1908. 159 F. R. p. 143.)

PATENTS—INFRINGEMENT-PNEUMATIC TOOL.

The Boyer patent, 537,629, for a pneumatic tool, as construed and limited by prior adjudication, held not infringed.

WESTINGHOUSE ELECTRIC & MFG CO. v. CONDIT ELECTRICAL MFG. CO.

(Circuit Court, S. D. New York. Jan. 7, 1908. 159 F. R. p. 144.)

1. PATENTS—SUIT FOR INFRINGEMENT—PREVIOUS DECISIONS—EFFECT.

Upon the question of the validity or construction of a patent, the judge of a Circuit Court is not bound by a decision of a Circuit Court of Appeals of another circuit, but it is his duty to exercise an independent judgement, giving to such decision the weight to which, in his opinion, its reasoning entitles it.

2. SAME-INFRINGEMENT-CIRCUIT BREAKER.

The Wright and Aalborg patent, No. 633,772, for an automatic circuit breaker, while an improvement patent in which none of the elements of the device are broadly new, covers a new combination which produces better results and discloses invention, claims 2 and 5, construed, and held infringed.

3. SAME—IMPROVEMENT PATENTS.

In the field of improvement each patentee must stand on the specific improvement disclosed in and covered by his claims, and improvements subsequently made by another, though in the same field of improvement, do not infringe unless the changes are colorable merely, and consist of the substitution of well-known equivalents, or mere changes of form or interchange of parts.

4. SAME—EQUIVALENTS — SUBSTITUTION OF SPRING FOR PIVOT.

A spring substituted for a pivot in a patented combination where it permits the same movement and does the same work is an equivalent, and the substitution does not avoid infringement.

WESTINGHOUSE ELECTRIC & MFG. CO. v. CONDIT ELECTRICAL MFG. CO.

(Circuit Court, S. D. New York. Feb. 17, 1908. 159 F. R. p. 154.)

1. PATENTS—SUIT FOR INFRINGEMENT-CONSTRUCTON OF STATUTE—"DAMAGES."

In Rev. St. § 4900 [U. S. Comp. St. 1901, p. 3388] which provides that, where a patentee has failed to mark the patented articles as therein required in any suit for infringement, "no damages shall be recovered by the plaintiff except on proof that the defendant was duly notified of the infringement" and continued to infringe after such notice, the word "damages" is used as meaning all sums which the complainant would be entitled to recover and includes profits.

2. SAME — FAILURE TO MARK PATENTED ARTICLES—NOTICE OF INFRINGEMENT.

In a suit for infringement of a patent, where the bill does not show that the patented article was marked as required by Rev. St. § 4900 [U. S. Comp. St. 1901, p 3388] it must clearly allege that explicit notice of infringement was given to defendant, otherwise damages are not recoverable except for infringement after the suit was commenced. An allegation that defendant was informed or had knowledge of the infringement is insufficient.

NATIONAL CARBON CO. v. NUNGESSER ELECTRIC BATTERY CO.

(Circuit Court, N. D. Ohio, E. D. August 2, 1907. 159 F. R. p. 157.)

PATENTS—INFRINGEMENT-BATTERY FILLER.

The Richmond and Zeller patent, No. 641,546, for a battery filler, held not anticipated, valid, and infringed.

BENBOW-BRAMMER MFG. CO. v. RICHMOND CEDAR WORKS et al.

(Circuit Court, N. D. Illinois, E. D. Feb. 6, 1908. 159 F. R. p. 161.)

PATENTS- INFRINGEMENT-MEANS FOR OPERATING WASHING MACHINES.

The Schroeder patent, No. 535,465, for means for operating washing machines, has for the essential element in the combination shown, a sliding cylinder on the operating shaft, through which cylinder alone motion is communicated to such shaft, and is not infringed by a machine having no such cylinder, but in which the teeth or cogs are mounted directly on the shaft.

TYSSOWSKI v. THAYER et al.

(Circuit Court, N. D. Illinois, E. D. Feb. 6, 1908. 159 F. R. p. 165.)

PATENTS—AGGREGATION OF OLD DEVICES—PYROGRAPHIC TOOL.

The Tyssowski patent, No. 727,034, for a pyrographic tool, "comprising a combined pyrographic point and a scorcher," covers a mere assembling in one implement of two distinct devices of the prior art, not capable of conjoint use, and each of which maintains its autonomy and works independently of the other in its accustomed manner, and having no influence on the other or its operation, and is void as a mere aggregation and for lack of novelty. The scorching device, if conceded validity, must in view of the prior art be limited to a tapering nozzle, and is not infringed by one in which the inner walls are parallel.

AMERICAN SULPHITE PULP CO. v. GREAT NORTHERN PAPER CO.

(Circuit Court, D. Maine. February 7, 1908. 159 F. R. p. 167.)

PATENTS—SUIT FOR INFRINGEMENT-INJUNCTION.

On application for a preliminary injunction to restrain the use of structures alleged to infringe a patent which had but a few weeks to run denied, and consideration of the claimed right of complainant to a perpetual injunction against such particular structures on the ground that they were built with knowledge of the patent, and that it had been sustained and were piratical, postponed until final hearing, there being no claim that defendant was insolvent, and it appearing that the injunction would subject it to great inconvenience and loss.

CURTIS v. HUMPHREY.

(Circuit Court, N. D. Illinois, E. D. Feb. 15, 1908. 159 F. R. p. 169.)

PATENTS—INFRINGEMENT—AUTOMATIC EGG BOILER.

The Curtis patent, No. 557,192, for an automatic egg boiler, construed, and held not infringed.

HILDRETH v. NORTH.

(Circuit Court of Appeals, Second Circuit. Feb. 11, 1908. 159 F. R. p. 428.)

PATENTS — SUIT FOR INFRINGEMENT — PRELIMINARY INJUNCTION.

Where a patent is a very recent one, and its validity has not been adjudicated, and both validity and infringement are denied, a preliminary injunction against its infringement should not be granted, but the issues should be left for determination at final hearing.

MECHANICAL INVENTIONS AND DESIGNS.

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Frank G. McGinnis, Lynchburg, Va. Skid.—This invention has for its object to provide a skid, adapted to be securely fastened to a dray, or other vehicle, and capable of enabling a truck to be run directly upon the same, so as to obviate the necessity of removing the load from the truck and then lifting it or skidding it by hand into the vehicle.

William A. Schmalz, Avoca, Pa. Square.—An object of the invention is to provide a square, designed particularly for carpenters, stone cutters, and other mechanics who are compelled to carry a kit of tools, and to enable the legs of the square to be readily separated for arranging the square compactly for carrying purposes and to prevent the square from being bent or otherwise injured, and also to permit the length of one of its legs to be varied so that it will not be necessary to carry two complete squares.

James P. Montgomery, inventor; G. L. Edwards, assignee, Wichita, Kansas. Pump.—This invention has for its object to provide a pump, designed to be operated either by a windmill or by hand, and equipped with means for rendering the operation uniform, and for preventing the jar and vibration incident to the operation of an ordinary pump by a windmill. Another object of the invention is to provide adjustable counter-balancing means, adapted to partially counter-balance the weight of the pump or sucker rod, in order that on the up stroke, it will be necessary to lift only a portion of the weight of the said rod. Furthermore, the invention has for its object to provide a pump of this character adapted for pumping either oil or water, and capable of maintaining a constant agitation of the liquid to prevent sand from entering in the valve and clogging the pump.

Lee J. Chapman, Lancaster, Ohio. Two patents.—The first patent relates to a cuspidor carrier, adapted to enable a cuspidor to be grasped, carried and released with one hand, so that two cuspidors may be easily handled by one person. Another object of the invention is to provide a cuspidor carrier, adapted to enable a cuspidor to be inverted without the hands of the operator coming in contact with the cuspidor or its contents and without requiring the operator to stoop.

The second patent covers a dust pan, adapted to be operated with one hand to hold it in position to receive the dust, to carry it and to empty the dust from it.

Richard Johnson, Sr., Freeport, Ill. Coupling for Traction Engines.—The object of this invention is to produce a coupling adapted to be readily applied to the draft bar of a traction engine, and capable of coupling automatically and of automatically releasing the tongue of a separator or other machine, when the coupling is unlocked. Another object of the invention is to provide a coupling equipped with jaws, capable of a free lateral movement to prevent them from being strained while turning the traction engine and the separator, and also when traveling over uneven ground.

S. J. Harding, West Baldwin, Me., inventor; Fred D. Harding, Baldwin, Me., assignee. Cake Cutter.—It is the aim of the present invention to provide a cake cutter, adapted to cut dough either round or scalloped, and with or without a central hole or opening. Another object of the invention is to provide a cake cutter in which it will be unnecessary to remove any of the parts in order to cut any one of the several forms, and which may be quickly changed from one to form another.

Ira E. Burley, Highwood, Mont., inventor; John Henry, Knoxville, Tenn., assignee. Measuring Instrument.—An object of this invention is to provide a combined level and plumb, equipped with means for enabling it to be employed as an inclinometer for determining whether objects are level, plumb, or inclined, and for ascertaining the angle or degree of inclination, if inclined.

Harry Harden, London, Ohio. Cutting Implement.—The object of the invention is to provide a cutting implement, adapted to be employed for a variety of uses, and capable of enabling great force to be exerted when desired. Another object of the invention is to provide a cutting device, designed particularly for dehorning cattle and capable of severing a horn from the head of an animal with a sheer cut, and of removing the horn close to the roots.

Fred Wheeler, Sodus, N. Y. Toy.—The object of this invention is to provide a toy which is highly amusing, easy of manipulation, and cheap to manufacture. The invention comprises a casing having a representation of a head thereon, and having openings corresponding to the eyes of such representation, and a single carrier rotatably mounted within the casing and provided with the representation of a plurality of eyes that are movable into, and out of, register with said openings.

James M. Thomas, Talladega, Ala. Chock.—The invention relates to means for chocking the wheels of vehicles to prevent retrograde movements of said vehicles and relieve the draft animals of strain when at a stand-still on hills or grades, and has for its object to provide a simple mechanism that can be conveniently applied to a wagon; is adjustable to properly co-operate with wheels of different diameters, and will constitute an effective chock which can be readily moved to an operative or an inoperative position.

Edgar J. Hannah, Kansas City, Mo. Mechanical Movement.—This invention relates to means for converting rotary into reciprocatory motion, and has for one of its objects to provide a movement in which any length of stroke required may be obtained without increasing the leverage against the driving pinion from the axis of the same to the pitch line of the teeth; and also to provide mechanism that will give any length of stroke desired independently of the size of the driving gear or number of teeth thereon or on the yoke.

William J. Orr, West Plains, Mo. Agricultural Implement.—This invention has for its object to provide a simple tool which may be used for a variety of purposes, as for instance, in transplanting strawberries and other plants, in patching bare places of lawns, and in extracting weeds; and is of such construction that will obviate the necessity of the operator bending over and removing each weed therefrom as it is extracted.

Hilbert C. Rhoads, No. 517 Rose St., Chester, Pa. Screw-Eye Driver.—This invention has for its object to provide a device for setting screw-eyes, screw hooks and the like, said device being adapted to be quickly engaged and disengaged with the article to be set. A further object is to provide a device that can be operated by one hand in order that it may be used by awning makers and hangers to special advantage, permitting them to quickly and conveniently set screw-eyes and the like in places which have heretofore been reached with much difficulty.

Joseph S. Click, Bridgewater, Va. Plow.—This invention relates principally to manually operated garden plows or cultivators, and has for one of its objects to provide a structure wherein the weight and draft are placed as low as possible in order to overcome the heaviness so noticeable in implements of this character; and to provide means whereby the plowing device may be made to properly operate in soils of different characters, and under varying conditions of use.

Charles H. Thompson, Munice, Ind. Lock for Stop-Cocks.—The invention relates to means for locking the stop-cocks of air-pipes and the like against accidental or unwarranted movement, and has for its principal object to provide an exceedingly simple device which can be readily applied to the ordinary type of structure, will constitute an effective lock for preventing the turning of the valve or cock, and can be easily detached when desired.

Peter J. Schelb, Ft. Worth, Texas. Light Reflecting Device.—The object of this invention is to provide a simple, inexpensive and efficient device designed to be placed on a piano, organ or other musical instrument, at the top thereof, and adapted to form a suitable support for a lamp or other light-producing device, and capable of reflecting the light downward and backward on the music board and music with multiplied power; which will not interfere with the use of an oil-cloth or other protecting cover of a piano or other musical instrument, and which, at the same time, will serve as a shade for the eyes of the musician or performer.

James W. Scott, Oswego, N. Y. Card Feeder.—This invention relates particularly to that class of machines commercially known as Bramwell Feeders, and has for its object to provide a novel means whereby the material, in its mixed condition, as caught by the conveyor will be evenly distributed from the feeder, and the selection or separation of the different classes of stock, with the return of the shorter, is entirely avoided; also to provide a simple alarm and stop mechanism, whereby when the stock is low, the operator will be notified, and the entire carding mechanism supplied by the feeder may be automatically stopped, if desired.

Charles Silcott, Vanderburg, Ky. inventor; R. W. Shirkey, Mansfield, Ohio, assignee. Removable Bottom Frame for Vehicle Tops.—An object of the present invention is to provide a bottom frame, adapted to enable a vehicle top to be readily applied to and removed from a vehicle seat, whereby the vehicle may be used either with or without a top.

Oliver W. Fisher, Jersey Shore, Pa. Three patents.—The invention covered by the first patent has for its object to provide a grain drill, equipped with dropping mechanism capable of fine adjustment, whereby the desired quantity of seed and fertilizer may be accurately and uniformly dropped, while the machine is traveling over a predetermined area. Another object of the invention is to provide a machine of this character in which the dropping mechanism may be quickly adjusted to arrange the same for sowing various kinds of grain.

The second patent relates to a plow attachment adapted to be readily applied to a plow and capable of crushing down weeds, grass and stubble and of leveling the same while plowing a field. Another object of the invention is to provide a device of this character, adapted to be quickly arranged out of the way when it is desired to turn the plow at the end of the furrow, and capable of vertical adjustment on the beam of the plow to arrange it at the desired elevation, and movable longitudinally of the beam to position it properly with relation to the plowshare.

The third patent covers a potato planter capable of opening a furrow, depositing the desired amount of fertilizer therein, dropping potatoes accurately in the said furrow and finally covering the potatoes. Another object of the invention is to provide a potato planter, equipped with rotary means carrying a plurality of devices, adapted to convey the potatoes from a hopper to a discharge spout and capable of automatically delivering a potato to the discharge spout from a receptacle independently of the hopper, should anyone of the potato-carrying devices fail to convey a potato from the hopper to the discharge spout.

James H. Couper, Atlanta, Ga., and William L. Albright, St. Petersburg, Fla., inventors; William L. Albright, St. Petersburg, Fla., assignee of the first patent. Two patents. The first patent relates to a kitchen cabinet, and has for its object to provide a kitchen cabinet capable of compactly storing and rendering conveniently accessible materials used for culinary purposes, and adapted to protect such materials from the inroads of animal pests and the deleterious effect of climatic changes.

The second patent covers the ornamental configuration and decoration of the kitchen cabinet.

Ernest F. Cavelier. Jacksonville, Fla. Can Cutter and Spout.—An object of the present invention is to produce a device adapted to open a can and provide a spout for pouring off the liquid contents thereof. Another object of the invention is to enable the can cutter and spout, when in use, to be locked against both inward and outward movement, and to permit the same, when a can is empty, to be readily detached for use on another can.

Albert J. Grunert and William S. Whitney, Ft. Smith, Ark. Station Indicator.—This invention has for its object to provide a device designed particularly for use on street cars for indicating the name of the street on which the car is running, and also the names of the intersecting streets. A further object of the invention is to enable the mechanism to be readily set for actuating the name strip in either direction, to arrange the station indicator to correspond with the direction in which the car is running.

Ira C. Shaw, Mt. Pleasant, Pa., inventor; Charles Sandusky and Wm. Price, Mt. Pleasant, Pa., assignees. Tapping Machine.—The present invention has for its object to provide a tapping machine, designed for tapping pipes and mains and adapted to enable a pipe or main to be tapped with greater rapidity and ease than heretofore.

Thomas M. Butler, Noblesville, Ind. Ice Saw.—The object of the present invention is to provide a saw for cutting ice while the latter is lying within an ice box, refrigerator, or other receptacle, without removing the cake of ice from which the pieces are to be cut. Another object of this invention is to arrange the handle of the saw in such relation with the edges of the blade that the latter will serve as a guard to prevent the hand of the operator from striking either the ice or the receptacle, when operating the ice saw either vertically or horizontally, and to equip the blade with means adapted to be introduced into the kerf for breaking off a partially severed piece from the rest of the cake.

NEW PATENTS FOR SALE.

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FOR SALE—Patent No. 914,241, issued March 2, 1909. A two horse road working machine. Simple, practical and easily manufactured. Will sell outright or by territory or royalty. Address, A. C. Callendar, Port Gibson, Miss. aug

FOR SALE—A money maker in nut lock. Will sell cheap for cash. Patent No 912,499. Must be sold to meet payments and will sell at once. All letters given prompt attention. Address, W. H. Snavely, R. F. D. No. 2, Spring Mills, Pa. aug

FOR SALE—A new type of pipe wrench. Patented December 22, 1908. If looking for something of this kind above the ordinary, address V. J. Coughenour, Carlton, Ohio. aug

FOR SALE—Patent No. 912,152. Fire Escape. An invention of remarkable merit and one which will have large sales. Price reasonable. For full particulars, address P. Nigro, Clarksville, Tenn. aug

FOR SALE or partner wanted—Two good new patents, one U. S. and one in Canada, on wire supported brooms. Best made. Owing to advanced age and physical infirmity will sell cheap. Address, William Fanckboner, 123 Ruby Street, Houghton, Mich. aug

FOR SALE—Patent No. 885,460. A Rural Mail Box. Its sides differently colored. Will revolve either to right or left. Stands firmly in different positions. Its different colors and different positions answer all signals. Address, S. J. Felknor, Route 3, Morristown, Tenn. aug

FOR SALE—U. S. Patent No. 913,723, dated March 2, 1909. "The Handy Stanchion." Secures or releases the full row of cattle (or part of row) instantly. A simple, safe, perfect and cheap device. Address, Royal Grafton, Mount Charles, Ont., Canada. aug

FOR SALE—Patent No. 876,264, dated January 7, 1908, Measuring Instrument. A combination level, plumb and inclinometer. Gives the length and hevel of rafters, and intended to be fitted with a telescope and mounted on a tripod for surveying railroad grades, canals, etc. Address, Ira E. Burley, Highwood, Montana. aug

FOR SALE—Patent No. 899,675, dated Sept. 29, 1908. Attachment for ironing boards; an article that is wanted by every house wife; will sell outright at reasonable price; have not means to manufacture. Address, Joseph Michael, 446 North Railroad St., Pottsville, Pa. jun

FOR SALE—Automatic Show Case. Can be made in several sizes. Adapted for fouutain pens and jewelry especially. Convenient and simple. Will sell cheaply if taken at once. Address, L. Peters, Marinette, Wisc. jun

FOR SALE—Patent No. 912,603. Hand massage machine with tools for making same. Very durable and a good seller, runs without electricity. Will turn over orders for $15,000 received, with the patent. Money wanted to develop a different line of business. Will sell right if sold quick. Address, P. O. Box 816 A, Kalamazoo, Mich. aug

FOR SALE—Patent No. 901,124, dated Oct. 13, 1908. Air agitating device for valve-bearing solutions, or any solution requiring constant agitation. For full particulars address, Thomas A. Ross, Selby, Contra Costa Co., Cal. nov 09

FOR SALE—Patent No. 902,746, dated Nov. 3, 1908. Self-Fastening Hook and Eye. Quickly attached. Looks much like the ordinary hook-and-eye. A certain success. Outright for $2000 or state rights. Address, H. N. Legan, 677 South Pennsylvania St., Denver, Colorado. jun

FOR SALE—Newly patented nut lock washer. A perfect locking device. Great money maker. Write for free sample. Address, Frank Matoushek, Gregory, South Dakota. jun

FOR SALE—U. S. Patent on a non-refillable bottle. No. 898,575, patented Sept. 15, 1908. For sale at reasonable price, or to let on royalty. Send 10 cents to the publisher of "Inventive Age," (giving this patent number) for a copy of the patent giving full description of same, or write to me for particulars in the matter. Reuben R. Graves. R. F. D. No. 3, Box 35, Salem, Oregon. jun

FOR SALE—Patent No. 883,624, dated March 31, 1908. Rock Digger, for clearing loose rock from farm lands, as well as for other purposes. Address, W. L. Combs, Bear Creek, Montana. jun

FOR SALE—Patent No. 907,493, issued Dec. 22, 1908. Sash Lock. A new device and good money maker. Like to sell outright for a reasonable price. Address, O. Gunther, P. O. B. 114, Kellogg, Idaho. jun

FOR SALE—Patent No 878,464 Hook and Eye. Can be ironed over or put through clothes wringer, as it is perfectly flat. Will double sale of other hooks and eyes. Address, W. H. Knobloch, Erie, Pa. jun

FOR SALE—The Perfect Cistern, patented April 21, 1908. This is a useful invention and will sell well in county rights. Write for circular and particulars. H. H. Wise, Decatur, Ill. jun

FOR SALE—Patent No. 905,918, dated Dec. 8, 1908. Front Wheel Drive for Traction Engines. Address, John A. Peters, Plum Coulee, Manitoha, Canada. jun

FOR SALE—Patent No. 909,918, issued Jan. 5, 1909. An Electric Burglar Alarm which rings the alarm and shows the particular door or window being opened. Will sell outright or state and county rights. Address, John D. Wheeler, Salem, Oregon. jun

FOR SALE—Patent No. 901,325. $5,000 will secure an active or silent one-half interest in an up-to-date toy that will return investment on first year's sales. Will sell outright for $8,000. Act quickly. Address, William H. Davis, Federalsburg, Md. jun

FOR SALE—U. S. Patent No. 891,036. Self-Ejecting Penholder. Slight pressure on upper end ejects broken or damaged pen from holder. Address, Edward Browning, Boone, Iowa. jun

FOR SALE—Patent No. 905,141, dated Dec. 1, 1908, Terminal Insulator. Simple, practical and easily manufactured. Correspondence solicited with manufacturers of electrical devices. Address, L. L. Bogue, East Orwell, Ohio. jun

FOR SALE—U. S. Patent, Suspending Ring. Needs no sewing. Can be used over again for curtains, portieres, hars, drapery, etc. Easily put on and taken off. Apply to S. P. Vetter, Patterson, Louisiana. jy

FOR SALE—Patent No. 904,914, dated Nov. 24, 1908. Musical Teething Ring. On royalty hasis or outright or both. Rubber goods manufacturers, please notice. A. W. Anderson, Fort Chatham, Seldovia, Alaska. jy

FOR SALE — Patent No. 884,599. Improved Stanchion Latch. This is a drop or gravity latch The best stanchion latch kuown. Indispensable when once the farmer or dairyman has tried it. Address, D. E. Miles, Box 597, Fredonia, Kansas. jy

FOR SALE—U. S. Patent No. 902,831, dated Nov. 3, 1908. Self-luhricating bushings for pulleys. Will sell outright. Write C. A. Petersen, P. O. Box 41, Laconia, N. H. jun

FOR SALE — Patent No. 906,635. Street-Car-Brake. Works hy foot lever. Does away with hard-working crank. Want correspondence with honest men and manufacturers to place hrake on the market. Would sell state rights. Address, J. G. Kerr, Ionia, Kansas. jy

FOR SALE—Patent No. 899,487, dated Sept. 22, 1908, Pick Ax Guard. A device that is much needed in rock work and coal mines. Invented hy a blacksmith who knows what is needed. Saves the handle from wearing out. Address, W. Gordon, High Falls, New York. jy

FOR SALE—Patent No. 907,612, dated Dec. 22, 1908. Carpenter's Gages and Scribers. Cheap for cash. Address, A. Krehlik, 1909 Buckeye Road, Cleveland, Ohio. jun

FOR SALE—Patent No. 905,058. "Autosleigh." Money maker. Investigate. Address, C. Whitney Dennis, Euclid Ave., Hackensack, N. J. jun

FOR SALE—Valuable patent in medical line. Would trade or invest part in stock company. Price $10,000. Address, P. W. Shute, White Pigeon, Michigan. jun

FOR SALE—Patent No. 851,348. A patent gasoline generator torch for gasoline lamps that does away with the alcohol torch. Write C. T. Edward, Greensburg, Ind. jun

FOR SALE, or on royalty—Patent No. 902,997, issued Nov. 3, 1908. Sanitary Automatic Water fountain for Poultry or Cattle. The fountain is closed against contamination, etc., until they come to drink, when it opens to let them drink, and when they leave it closes again. It can be operated while stationary. Address, Richard Partington, Barnesboro, Pa. jun

FOR SALE—Patent No. 898,685, issued Sept. 15, 1908, Keyless Door Lock. A substitute for lost keys and broken locks; fits any lock. It locks securely when everything else fails. No tools needed; no scratching of doors. Will sell outright or on royalty hasis. Address, Simon N. Ritter, P. O. Box 323, Allentown, Pa. jun

FOR SALE—U. S. Patent No. 864,792, issued Sept. 3, 1907. Meek Window Ventilator. Is attached at top of upper window sash and provides against down draft. The wind entering the room is directed to ceiling, and protects window curtain and shade. Is easily manipulated. Will sell at reasonable price. If interested, write for descriptive hooklet and testimonials. A. S. Meek, Washington, Iowa. jun

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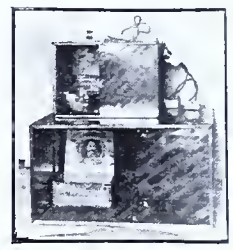
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A Patent Bar.

The Commissioner of Patents in his last report to Congress, made the following recommendation:

"I desire to invite the attention of the Congress to the necessity for legislation which would result in the establishment of a patent bar. It is suggested that a law be enacted providing that before an individual be permitted to practice before the United States Patent Office, he shall be required to first pass an examination as to his moral, legal, and technical qualifications: that a committee shall be appointed by the Commissioner of Patents, composed of Patent Office officials and patent attorneys of well-known standing in the profession, who shall conduct the examination under the direction of the Commissioner of Patents, and the report of said committee shall be subject to his approval."

We heartily endorse the plan above suggested. While the rules now governing the admission of attorneys to practice before the Patent Office are more strictly applied than they were some years ago, there is still much to be done in order to raise the standard of the patent profession. After the Wedderburn episode, the Patent Office established a system of registration, following in this respect the practice of other countries. Strange as it may seem, it was not until 1897 that it was thought necessary to adopt such a plan in the United States. Before that time, any one could put his name on an application for patent as an attorney. Under the system which went into effect in 1898, every attorney was required to be registered; but the rules of registration were so loosely drawn and liberally interpreted that almost any one could have his name placed on the rooster. Draftsmen, engineers, attorneys at law and others who hardly knew what a specification was, were allowed to enter their names and to advertise themselves to the world as "registered attorneys," assuming the dignity inherent in the title. Within the last few years the Patent Office has begun to perceive the lack of wisdom displayed in the loose application of the rules. According to the present construction, an attorney cannot register until he is able not only to cite the patents which he has prosecuted by number and date, but to produce a certificate from the judge of the court of the district in which he is located, stating that he is a citizen of good moral standing, and believed to be qualified to act as an attorney. This however does not go far enough, since judges as a rule are not particularly competent to pass on a man's ability as a patent lawyer, so that the Commissioner has taken an important step in requiring an individual to pass an examination as to his moral, legal and technical qualifications. This is a wise move, and we hope that Congress will act upon the suggestion. Before an attorney can become a member of the bar, he must pass a rigid examination and show that he has studied law for a certain number of years either in a private office or in a law school. While the proposed legislation would not affect the attorneys now practicing before the Patent Office, (many of whom are incompetent) it would serve to keep out the undesirable class who have made the patent profession a subject of mockery, and lowered the standard of the patent attorney. The legislation cannot be enacted too soon for the benefit of the inventors of the country.

Save the Models.

If there were no other argument for the erection of a new building for the Patent Office, the fact that the models which were formerly displayed in the present office are now stored in inaccessible boxes, furnishes a most important reason why the efforts in this direction should be crowned with success. Prior to 1880, every applicant for a patent had to furnish a model, but in that year it was seen that the accumulation of models would soon cause the building to overflow, with the result that the sending of them was made optional. For many years after 1880, it was only occasionally a model was called for, and then only from certain divisions of the Office. Now it is an extremely rare thing for such a requirement to be made. To make up for this, it has become necessary for the drawings to be made with greater care and the features of the invention more clearly shown, than they were when models were demanded. Because of the fact that the drawings in many of the old patents are not clear, the models received in those cases have become of great importance, especially when litigation arises. There is a model maker in Washington who spends most of his time in filling orders for copies or duplicates of old models, to be supplied in matters pending before the courts. Very frequently during the prosecution of an application for patent, an attorney in considering an old grant, finds it necessary to examine the model for the purpose of assuring himself that his understanding of the patent is correct. These models should be accessible not only for this purpose, but also for the benefit of the general public, as they possess a distinct educational and historical value which should insure the provision of a suitable space for their display. There is a bill before Congress to provide for a new building, but apparently little interest is taken in the matter. This collection of models could be arranged advantageously in the new building, where it would not only furnish an interesting exhibit for the public, but be of value to attorneys in their work before the Patent Office. Because of the pressing and ever increasing demand for room, the models are now stored in boxes in the basement and in the corridors of the present building, where they are not accessible for the purposes for which they were intended. It is unfortunate that more interest has not been taken in the bill which Senator Daniel introduced, but we presume that this and all other proposed legislation involving the appropriation of money will have to wait until Congress has evolved a plan which will turn the Treasury deficit into a surplus.

Sterilizing Railway Ties.

Since the germ has been recognized as the most insidious and deadly of all the enemies known to mankind, resolute efforts are being made to combat its forces in every possible direction. Disinfection and sterilization are the twin weapons employed in this continual warfare, and we have become accustomed to the need of purifying the food we eat, the air we breathe, and the objects we touch. It was with some surprise, however, that we heard that the practice of sterilization had been extended to railway ties; but this statement was followed by the admission that the treatment was not with a view to sanitary effects. It is rather with a desire to prolong their usefulness, and it is claimed that sterilization is one of the best methods of preservation.

With the gradual diminution of the world's timber supply, the problem of a substitute for the wooden cross tie is being given increased attention in railway circles. Already the steel tie has been introduced, and a new department in the great works at Homestead is being devoted entirely to this article. The idea still prevails, however, that by impregnation with certain chemicals the decay of the wooden cross tie may be prevented to a degree which would render it more useful than and financially preferable to the metallic substitute.

Important experiments have been recently conducted in France, to determine the effect of sterilization of ties upon their durability. The decay being mainly organic, the investigators concluded that the germinating basis of this action would be prevented by sterilizing the wood. Impregnation with chemical antiseptics is unsatisfactory because of the impossibility of penetrating the whole log with the liquid. A crack will lay bare parts not reached by the treatment. The new experiments exposed the log to a stream of steam, and it was shown that the heat penetrated the wood, and that it became saturated. Although it is too early to report results, the experimenters have strong hopes that this method of preserving ties will be found superior to any heretofore known.

Vanadium.

Although relatively a new comer in the field of industry, vanadium has already justified its existence. It appears to have three effects on the other metals with which it is combined — toughening, strengthening, and scavenging. A certain proportion of it added to copper means an amazing increase in tensile strength. Added to bronze bearing metal, it improves its elasticity and compressive strength. In cast iron, it lengthens the life of the metal more than three fold. But it is in connection with steel that its commercial value has been most forcibly demonstrated. Many railroad lines have adopted it for cast steel engine frames and transmission bars, as well as for forged piston rods, tires and springs and firebox sheets. It may in time come into employment with solid wheels and curved rails. A driving spring of vanadium, locomotive builders have found, requires twice the pressure to force it down that the regular spring does, and besides it can be almost indefinitely deflected. Under heavy and repeated stress, it retains its resiliency much better than the old spring. It is also very valuable for pneumatic hammer riveting dies. The average life of a die is only ten hours, as the constant impact causes the steel to crystallize. Vanadium steel dies have been used for this purpose for fifteen months without being rendered unfit for service. In edge tools, it has been shown that vanadium steel has a much longer life than the best steel heretofore employed, as it retains the cutting edge longer, and owing to toughness, one of these tools seldom breaks. Such uniform satisfaction has resulted from its employment that vanadium can be advantageously used almost anywhere.

Another Exposition.

With true Yankee foresightedness, a movement has been started in Boston to commemorate the three-hundredth landing of the pilgrims in 1920. This early announcement, it is explained, has been deemed necessary in order that the world shall know that that year is reserved for a World's Fair; and New England is to devote the intervening period to plans and preparations for an exposition on a scale and magnitude commensurate with the importance of the event which was the birth of the American nation. Of all parts of the Union, New England alone has never had its World's Fair, and we most heartily wish success to the undertaking. There is no date in our history which better deserves commemoration, and there is no doubt that the enterprise will command the approval and support of the American people of all sections and of all classes.

Flames Without Heat.

One of the objects for which science is seeking with as much eagerness as was shown by alchemy in its quest for the absolute, is the cold flame—the lamp which will yield only a brilliant light, and no heat. Every few years there comes the announcement that the problem has been solved, but so far the discoveries have failed to materialize. And yet the idea has many natural phenomena and much science to support it. Nature has actually offered the world a cold flame and a heatless light, in the firefly and the glowworm. The origin of this illumination, so bright in proportion to the size of the insect that produced it, has long puzzled students; but it is now recognized that it is due to ether, one of the most subtle forces in Nature, that is coming into the world knowledge. Like electricity, ether can be seen only in its workings, and in an indirect way; yet enough has been learned about it to make us understand that it flows through the atmosphere of the earth in great currents, unchecked by wood or stone, water or metal, flesh or soil. It is also known that ether is the direct parent of the X-ray and the speech of the wireless telegraph. It appears in the curious lights in the so-called vacuum tubes in the laboratory, and in the electric light bulb.

When the perfect vacuum is attained, much more curious results are expected. The firefly and the glowworm are examples of vacuum makers in Nature. A chamber of cartilege is located just beneath the skin of each, on the rear portion of their bodies. Immediately before the light appears, the insect contracts, the movements causing a vacuum in the sacs of cartilege. With relaxation comes the flame and the light, which are absolutely without heat. Experiments have shown that when forty or fifty fireflies flash simultaneously, there is no rise in temperature in the surrounding air. A number were enclosed in a glass jar with a bolometer—a sort of delicate thermometer, capable of registering a millionth of a degree of variation in temperature. The instrument showed that there was no disturbance. Experiments with glowworms gave similar results.

One of the singular characteristics of the cold flame is its power of making opaque bodies transparent—as illustrated in the operation of the X-rays. The bodies of the insects are always transparent when filled with flame. Blades of grass can plainly be seen through them. The light seems to diffuse itself through the substance and to make fiber and grain so luminous as to be invisible, other objects being seen as though nothing intervened.

Following the clues furnished by Nature, and the lines of discoveries already made, it can be only a question of time before the perfect vacuum is realized; and whatever results it may bring in other directions, it is certain that it will yield a flame, purified and heatless, penetrating as the rays of the sun and soft as the light of the stars. That such a house lighting utensil will be as common to the next generation as the electric light is to this one, is a safe prediction. The problem is as easy of solution as was the problem of the electric arc, a quarter of a century ago.

The firefly offers the key to the question. When a vacuum is made as complete as can be made by this tiny insect with its bodily compression and expansion, the future system of lights will be solved, consisting of nothing more than ether vibrations within a vacuum. Night will then be transformed into day, not by means of oil or carbon, metals or chemicals, but by setting the subtle and sensitive waves of ether in motion by a spring, clockwork mechanism, or some such simple device. The resulting illumination will be as superior to that yielded by electricity as the latter is superior to the candle of a hundred years ago.

Diving Under a Cathedral.

Extraordinary as it may seem, it was a submarine diver who bore the brunt of the work of saving the famous English cathedral of Winchester from slowly sinking to its doom in a bed of peat. A few months ago it was ascertained that almost the whole cathedral was standing on a bed of this substance, eight feet in thicknees. Owing to its compression, settlements of a serious nature were taking place. It was therefore decided to excavate the peat and provide in its place a solid sub-foundation: but in carrying the excavation down to the lowest layer a great volume of water burst up from the gravel strata below, rapidly filling the pit. This condition of affairs led to the decision to employ a diver for the work of removing the peat. The operations are described in a recent number of *Popular Mechanics*. The work was arduous, the pits sunk being absolutely dark, owing to the water being thick with peaty matter, and the use of artificial light was impossible. The peat was gradually removed and the bottom then covered with bags of concrete, carefully and tightly trodden in all around. These were cut open and another layer of bags placed on top, the operation being continued until the flood of water from the gravel was sealed down.

Submarine Photography.

The common accusation that Americans have no respect for privacy is supported by a recent device, designed to invade the fastnesses and expose the family secrets of the denizens of the deep. A camera operated by electricity is employed for the purpose, lowered by means of wires to any point which it is desired to investigate. An arc lamp is connected with the camera, the electrodes being covered with a casing of steel and glass. The conductors pass through tubes, which also admit air from the surface of the water. Two lateral arms extend from the casing, carrying small camera cases, the exposure of the plates being effected through glass lenses. A simple electro magnet device, controlled from above, operates the shutter and plate magazine. Some interesting revelations are expected from the employment of this apparatus. What the fishes will think of it is another story.

Development of the Typewriter.

The typewriter, that most requisite of office appurtenances, has probably undergone more steady improvement than any of the machines that have been designed to lessen labor. From a beginning of wood and wire and porcelain, with a squeak and a crash in every movement, its evolution into a compact, almost noiseless piece of wonderful mechanism has been very rapid. Changes have been wrought in every part of the typewriter, from key to ribbon. The first roller, says *Van Norden's*, was of wood; it is now of rubber in varying degrees of hardness to suit the different kinds of work. The first keys were of porcelain, spread out over a very large area, and as large as a quarter: they have now been reduced to less than the size of a dime, composed of hardened rubber generally, and brought within a minimum of space. The first spacing of the writing was done by hand; levers now perform the operation.

When these very essential changes were effected, inventors commenced to look to creating radical improvements. The visible typewriter is the result—a saving in time, for the writer does not need to lift the carriage of the machine to know what has been written.

Typewriters are generally made with the keys arranged in a circle in the center of the machine, but a modification (whether an improvement or not) was made by placing all the characters on one steel cylinder, which revolves around the axis. When a key is struck the type wheel revolves to the corresponding character, and it is impressed on the paper. The type wheels are made in every language used in commercial work, and an almost instantaneous substitution may be effected. Another radical change was made by so constructing the typewriter that, in using the shift key to bring the capital letters or the figures into use, all the keys at the writing points are shifted, as in most machines. Then the use of the shift key was obviated altogether by what is known as the double key board—a key for every character of the typewriter, as in the old-time caligraph. This, of course, necessitates a board of twice the area of that of the single key board, but the promoters say that the work may be done quicker, even with this double ground to cover, than where it is necessary to use the shift key.

Some typewriters are so arranged that the keys strike upward, against the under side of the roller. Others strike downward, from above. Still others perform the work by a lateral movement of the keys, and with the cylindrical arrangement of the type, the whole typewheel strikes forward and downward, in the rear of the machine. In some typewriters, the weight has been reduced to little more than five pounds, and these machines may be folded up and carried around very conveniently.

The ribbon, too, has been undergoing changes. It varies, according to the make of machine, from an inch and a half to less than half an inch in width. It is sometimes made in two colors, usually red and black, so that special work may be performed without changing the ribbon. Other machines dispense with the ribbon altogether and use an ink pad, against which the faces of the type rest when in normal position.

But even with all the improvements that have been made on the hundreds of parts of the typewriter, inventors are still working to further change the mechanism. An electric attachment has been invented which lessens the strain on the fingers of the operator: but it does not seem to have met with very general favor. With this attachment it is only necessary to touch the keys, the electric current completing the operation. Machines are now made to write Japanese, from right to left. The wireless typewriter has already been described in these columns; and now comes the pneumatic typewriter, without springs or levers, and with 30 per cent less parts than the ordinary machine. Compressed air is forced against the keys in such a manner that when a lever is depressed, by simply touching it, the air forces the type to strike the roller, the operation taking but the one hundred and twentieth part of a second. A perforated pattern may be made on this machine by an automatic duplicating attachment, and as this pattern is passed over the keyboard the perforations cause the machine to reproduce the writing, any number of successive copies being possible.

Explosive Coal Dust.

Recent investigations into the causes of mine explosions have resulted in the discovery that coal dust itself is dangerous. The U. S. Geological Survey, which has been experimenting in the matter, reports that peril from this source can be prevented by merely turning enough steam into the mine to thoroughly moisten the dust. Whether the consequent security is due to the heightened temperature or to the moisture, has not yet been decided, but that steam does destroy the explosive character of coal dust has been proven beyond doubt.

In the government experiments, a long iron tube resembling in size the usual mine tunnel, was employed. Into this, coal dust was forced in considerable quantities, followed by steam through an exhaust pipe. Dynamite was exploded in the tube, but the coal gas proved entirely noncombustible. Cold air was then substituted for the steam until the dust had been thoroughly dried. A dynamite shot under these conditions was instantaneously followed by an explosion of the coal dust. It will not be an expensive or elaborate process to arrange to supply enough steam to keep the atmosphere of mines moist, and it is believed that the employment of this simple method will entirely prevent accident from this cause.

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Sound-reproducing apparatus, 3 pats....W. O. C. Ellis
Spark-arrester....G. Dam
Spinning frame, Ring-....H. C. Hockenjos
Spool-holder....F. Mayor
Spring, Coil-....J. B. Knudsen
Spring, Furniture....J. L. Radermacher
Spring-uncoiling machine....H. W. Brashear
Spring-wheel....J. J. Collins
Spring-wheel....K. F. Elers
Sprinkler and hose-reel, Lawn....C. Buehler
Sprinkler emergency-stopper, Automatic-....J. J. Casey
Square, Tailor's....J. A. Carlstrom
Stamp, Time-....F. Purdy
Starching-machine....W. C. Straszer
Station-indicator....J. G. Harris
Steam-boiler....P. Barnes
Steam-separator....P. A. Johnson
Steam-separator and heater....G. R. Sisterson
Steam-trap....N. English
Steel, Metallurgy of....W. S. Simpson et al
Steel piling....G. G. Kriwoschein
Steering device....C. E. Brooks
Sterilizer....W. A. Wiley et al
Stick-pin and pencil, Combined....F. A. Rojas
Stirrup, Safety-....J. Solatinow
Stitch machine, Impression or imitation....A. C. Spencer
Stock-marker....C. F. Moffitt
Stoker, Mechanical....J. A. Caldwell
Stoker, Mechanical, 2 pats....W. H. Strouse
Stove....E. B. Hammond
Stove, Air-tight heating-....L. W. Hemp
Stud, Self-centering fixture-....J. L. Corey
Surveying instrument....G. N. Saegmuller
Sweat-band....E. M. Johnson
Swingletree-clip....S. Rogers
Switch....G. W. Hart
Switch....L. H. Moulthrop
Switch....G. Gaglio et al
Syringe....C. F. Welsh
Tack-puller....J. S. Swan, Jr.
Talking-machine needle....J. E. Sullivan et al
Talking-machine needle-holder....W. B. Claflin
Taps in receptacles for holding liquids, securing....E. O. Blackwell
Target, Drop-....J. Krcek
Target-throwing trap....E. D. Fulford
Target-trap....J. A. Crenshaw
Teat-cups, Pulsating....A. Gillies
Telegraph system....G. E. Hines
Telegraph, 2 pats....P. B. Delany
Telegraphy, Antenna for wireless....H. E. Athearn
Telescope, Prism-....C. S. Hastings
Templet for infolding-machines for collars, cuffs, etc....G. J. Dormandy
Tenter-frame....D. J. Tavenner
Testing machine....A. H. Emery
Thermometer-case....M. W. Reed
Thresher yielding concave....C. W. Clark
Threshing-machine attachment....C. O. Fredrickson
Tide-motor....W. J. White
Tie-tamper....F. J. Gilroy
Time-recorder, Workman's....C. T. Hawley
Time-relay for selective signaling....H. A. Watson
Tire, Pneumatic....B. Noldner
Tire sealing composition, Vehicle....W. W. McCord
Tire-sheathing....J. Marti
Tires and tubes, Making rubber....F. A. Magowan
Tires, machine for beveling air-tubes for pneumatic....A. Olier
Tobacco leaves, Machine for threading....W. T. Muggli
Toilet article....G. M. Irwin
Tongue-hounds....P. A. Gehring
Tool....I. E. Stump
Tool, Centering-....S. Saner
Tooth, Artificial....T. McCullough
Tooth-brush case....P. A. Rohr
Tooth-cleaning device....E. C. Chambers
Torch, Camper's....J. F. Menge
Torch, Vapor-....W. Claussé
Toy gun....J. B. Griffith
Train-indicator....P. Ferrari
Transformer system....K. C. Randall
Transmitting apparatus....H. Shoemaker
Trolley-guard....G. W. Sandiford
Truck, Baggage-....W. A. Allen et al
Truck, Car-....A. A. Kellogg
Truck, Railway-....H. H. Vaughan
Trunk, &c., catch-lock....D. W. Eggleston
Trunk-tray form....W. S. Gilson
Tubes, Apparatus for producing corrugated....A. Pogany et al
Tumbler-washer....J. S. Nash
Tunneling-machine....E. F. Terry
Twister stop-motion and measuring mechanism....A. E. Rhoades
Tying machine, Mantle,- 2 pats....S. Cohn
Type-casting machine....J. S. Thompson
Type-writer....C. C. Chrisman
Type-writing machine....W. J. Barron
Type-writing machine....B. C. Stickney
Type-writing machine....R. E. Martin
Type-writing machine....F. X. Wagner
Type-writing machine....O. Woodward
Type-writing machine....J. F. Forkarth
Type-writing machine....F. L. Morgan
Type-writing machine....H. Smith
Umbrella....J. P. Czapiewski
Valve....F. T. Reid
Valve....D. T. Williams
Valve....J. R. Goehring
Valve....L. W. Eggleston
Valve, Automatic retaining-....C. Martin et al
Valve, cover-ring....F. C. Blanchard et al
Valve, Float-....J. S. Brennan
Valve, Float-....G. J. Griffin
Valve for hot-water heating systems....H. G. Thomas
Valve governor, Triple-....C. H. Hughes
Valve-grinding device....R. H. Hazeltine
Valve-regulator....G. R. Miller
Valve-reseating machine....R. H. Hazeltine
Valve, Rotary....A. D. Catlin
Vamp-folding machine....B. A. Slocum
Vault, Burial-....C. K. Haw
Vault, Burial-....A. F. Tarr
Vehicle-brake....H. Copeland
Vehicle-door....G. E. Seidel
Vehicle-spring....R. Lancaster
Vehicle umbrellas and canopies, Support for....H. L. Johnston
Vehicle-wheel, 2 pats....G. W. Morris
Velocipede-saddle....F. H. Wilson
Vending-machine, 2 pats....W. C. Briggs
Vending-machine, Coin-controlled....J. L. Weed
Vending-machine, Coin-controlled mechanism....M. O. Anthony
Vessel, Heating....E. M. Leeper
Vessel propelling apparatus....J. Elniff
Wagon-body....W. A. Melrose et al
Wagon-brake....J. H. Huehn
Wagon, Composite road-....R. Jonas
Wagon, hand-propelled....N. Thomas
Wagon-jack....D. A. Gilchrist
Wall-bracket, Adjustable....A. W. Browne
Walls, Underpinning and supporting....T. K. Thomson
Washing-machine....L. M. Wilson
Washing-machine....D. H. Basehore
Watch-movement....G. Nutting et al
Water-closet....W. E. Gibson
Water-closets with soil-pipes, Pipe for connecting....W. A. Fleming
Water-heater....M. Greenberg
Water-jacket....C. W. Hawkes
Water-meter....C. Lory et al
Water-motor....W. C. White
Water-power gathering, developing, and manifolding device....S. S. Leach
Water-purification system....J. F. Wixford
Water-purifier....H. G. Dittbenner
Wave meter, Hetzian-....C. D. Babcock
Weighing apparatus, Automatic....H. W. Meyer
Weighing-machine....J. C. Graham
Wheel....J. J. Schimtz
Wheel....R. C. Blean
Wind-engine....E. W. Aller
Wind-screen....E. K. Conover
Windmill....T. O. Harstad
Windmill....W. S. Pope
Winding-frame, Automatic....F. Baum
Winding-indicator, Watch....L. L. D. Elderkin
Window and shutter lock....W. A. Jordan
Window attachment....W. Brown
Window construction, Fireproof....J. C. Specht
Window opening and closing device, Automatic....L. O. Kemp
Wire-stretcher....G. A. Linn
Wool-washing machines, Regulator for....F. L. Furbush
Work-bench, Carpenter's....A. R. Humes
Wrench....C. L. Stewart
Wrench....H. F. Howland
Writing-machine....L. C. Myers
Yarns, tissues, &c., Obtaining goffering effects on....C. T. Tredup
Yeast separating and washing apparatus....O. Selg et al

DESIGNS.

Cabinet, Sewing....H. R. Miller
Card, Menu-....M. Altman
Dish or similar article, Covered....C. J. Ahrenfeldt
Display-case....C. E. Shaffner
Paper, Box-....C. H. Bowman
Paper, Box-....M. Simpson
Plate or similar article....C. J. Ahrenfeldt
Shoe....G. Davis

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MECHANICAL PATENTS.

Abrading-machine....J. Milne, Jr.
Acids, Separating liquid from solid fatty....E. Twitchell
Advertising device....E. L. Lacomme
Advertising device....J. R. Warren et al
Advertising novelty and toy, Combination....F. G. Fawkes
Air and gas mixer and controller, Combined....J. H. Martindale
Air-brake system....J. Hughes
Air-brake systems, Automatic slack-adjuster for....U. S. Smith
Air-cleaning system....W. C. Mayo et al
Alarm....J. S. Jones
Alcohol, Producing from straw a liquid suitable for the production of....W. F. Giles
Alfalfa-reducing machine....L. W. Thompson
Amusement apparatus....R. Tossell et al
Anchor, Expansion bolt-....H. B. Newhall
Ant-trap....N. D. Fly
Ash-ejector for ships....L. Hochstein
Ash-pan, Locomotive....C. Kristufek
Atomizer and nebulizer....C. W. Meinecke
Awning....J. Rothchild
Axle-box dust-guard, Car-....H. C. Gamage
Axle, Car-wheel....C. W. Parker
Bag-crimping device....A. M. Bates
Baling-press....C. E. Wehrenberg
Bandage, &c....D. Sarason
Barber's shears....N. W. Race
Barge Skeleton....P. F. Dundon
Barrel, &c., closure....G. F. Williamson
Barrette or hair-retainer....G. G. Sinclair
Batteries, Electrolyte for primary....J. Whitcomb
Bearing, Gate-....I. C. Rankin
Bear-protecting device, End-....W. B. Hodge
Bearings, Cage for ball-....G. Sonnberg
Bearings, Cage for ball-....E. Geschke
Bed crib attachment....G. T. Spear
Bed head-rest....H. Kintz
Bed, Invalid-....F. L. Gaines
Belt-tightening and speed-changing mechanism....F. E. Marcy
Berry-stem remover....W. E. Urschel
Bicycle handle-bar....G. H. Houck
Binder, Temporary....O. H. Schraeger
Binder, Temporary....W. S. Mendenhall
Bit-stock....C. B. Gilmore
Bitumen from bitumen-bearing ore, Means for separating....G. M. Willis
Bitumen from bitumen-bearing ore, Process and apparatus for extracting....G. M. Willis
Block-molding press....J. C. Titus
Block-signal system, Automatic....S. H. Harrington
Boat....G. White
Boat, Bathing-....F. F. Gallaher et al
Boiler superheater, Steam-....C. J. Mellin et al
Bolt-holder....F. D. Pierce
Bolts, screws, &c., Apparatus for turning....G. X. Wittmer
Boot or shoe....J. H. Waite
Bottle-carrier....H. Junge
Bottle holder, Nursing-....G. U. Malpass
Bottle, Non-refillable....J. Casaccia
Bowling-alley....J. H. Stoddard
Box-board, Corrugated....W. G. Chapin
Box-stuff planing and sizing machine....G. A. Smith
Brake-shoe....W. O. Stark
Brick and tile, Enameled....J. H. Jackson
Brick, Wire-cut....F. B. Dunn
Brush....J. F. Buchanan
Brush, Air-....F. J. Lederer
Bucket....A. B. Marston
Bucket, Excavating....A. E. Holcomb
Buckets, Automatic catch-hook and release for dredge-....M. Hahn et al
Buckle....W. A. Holden
Building-block....A. White
Burglar alarm and signal system....G. M. Willis
Button....J. W. Schloss
Button....J. J. Carmody
Button, Separable....E. A. Phinney
Buttons to fabric, Attaching....B. T. Leveque
Cable clamp, Guy-rope-....L. H. Knapp
Cake and pie box....G. W. Ferdon
Calculating-machine....J. C. McLeland
Can-opener....G. H. Garnet
Cans, Hermetically securing covers on drawn or seamless sardine-....G. W. Weber
Cane, Balloon-....F. J. Creque
Cap, Infant's....M. Constantine
Car bolster, Railway-....T. A. Collison
Car-coupling....F. Mikeal
Car-coupling....J. Stankus
Car-coupling and bumper....J. Nagy
Car, Dump-....J. B. Rhodes
Car-fender....W. L. Chrysler
Car-fender....G. R. Watson
Car-fender, Street-....J. Lovass et al
Car lining, Box-....C. H. Clark
Car-step....L. Yeager, Jr.
Cars, device for hoisting swinging movements of suspended railway....F. W. Vogt
Carbonating apparatus....E. Marek
Carbureter....C. B. Sturges
Caretaker, Coin-freed....P. Funke
Cartridge-pocket....W. C. Fisher
Cartridge-shell machine....S. Rousseau
Caster-brake....W. F. Young
Castings, Device for making....H. M. Davison
Catch-basin cover....C. A. Johnson et al
Cells, Manufacture of sensitive....P. Ribbe
Cement sectional conduit, Reinforced-....H. J. Keenan et al
Centrifugal separator....W. A. Preston et al
Cesspool, Sectional....D. J. Menton et al
Chair....A. Sanders
Chair-attachment....D. S. Curtiss
Chickens, &c., Device for seizing and holding....A. T. Upton
Churn....R. F. Cornell
Churn-operating mechanism....W. H. Colman
Cigar-box and stamp....S. Rosenthal
Cigar-cutter and lighter, Automatic....P. H. Greear et al
Circuit-breaker....K. Kuhlmann
Circuit-breaker, Gas or vapor....P. H. Thomas
Cleaning-tools, Dust-display device for vacuum....J. S. Thurman
Clinometer....C. Larsen
Clothes-pin-making machine....A. Smith
Clothes-pole, Telescopic....A. J. Murch
Clothes-pounder....R. S. Harrington
Clutch....M. Flather
Clutch and mechanism therefor....W. H. Tschantz
Clutch mechanism....H. D. Lauson
Clutch mechanism....C. L. Whaley
Clutch throw-out....H. A. Hancock
Coffee and tea urn....A. G. Miller
Coffee-urn....E. C. Dalleine
Coin-controlled apparatus....A. Heimann et al
Coin-operated box....H. S. Mills
Coin packaging and counting machine....A. Serena
Combination-table....L. W. Miller
Compass, Mariner's....A. F. Smith
Concrete beam....P. Aylett et al
Concrete building construction....E. L. Ransome

Concrete construction, Metallic reinforce for, 3 pats.....D. A. Wedmore
Concrete-form band tightner..C. M. Markham
Concrete-structure reinforcing-truss.....H. E. White
Condenser.....R. D. Tomlinson
Condenser plant.....R. D. Tomlinson
Condenser, Surface.....J. F. M. Patitz
Conductor.....G. W. Bolton, Jr.
Controller.....T. von Tweigbergk
Conveying apparatus.....E. N. Johnston
Convertible table.....A. Shier
Cooker, Steam.....N. N. Chase
Cooker, Steam-ccabinet.....A. Oliver
Copper-converter.....F. E. Marcy
Copper from ores, Extracting...C. G. Collins
Core-arbor.....I. H. Long et al
Corn hanger, Ear-.....L. W. Hurff
Corn-topper.....S. E. Woods
Corn-protector.....C. T. Moore
Corset, Apparel-.....D. Kops
Cotton-chopper.....H. M. Vinson
Cotton-gin attachment.....H. L. Story
Cotton-picker.....J. E. Pierce
Cotton-picker.....S. J. Gray
Cotton-picker suction-head, Vacuum.....J. S. Thurman
Cotton-picking system, Pneumatic.....J. S. Thurman
Crate, Shipping-.....C. Kempf
Cultivator.....B. F. Russell
Culvert.....C. F. Alt
Current motor, Alternating-.....M. Milch
Curtain-fixture.....H. E. Keeler
Cycle, Water-.....W. Crepeau
Cylinder-tooth.....C. C. Jacobson et al
Dandruff-removing device.....J. S. Thurman
Derrick.....G. W. Lyen
Dial.....L. H. Starkey
Die and die mechanism.....F. H. Richards
Die and die operating mechanism.....F. H. Richards
Disinfecting and grease-removing apparatus, Combined.....I. S. Thurman
Display-rack.....W. M. Wilmore
Displaying device, Boot, shoe, &c....A. Glover
Ditching-machine.....E. D. Young
Door-hanger.....H. Fabian
Door hanger and track.....H. L. Ferris et al
Door-lock.....P. J. Pauly, Jr.
Door-opener.....K. I. Bronson
Door-opener.....W. H. Edwards
Door-operating mechanism.....W. H. Evans
Doweling-machine.....G. H. Farrington
Draft-equalizer.....W. W. Winger
Draft-rigging, Tandem-spring.....C. G. Harrington
Drafting instrument.....J. Samsonoff
Drawing-table.....E. C. Roberts
Dredges, &c., Spud-brace for..G. W. King et al
Drying and stretching frame...T. A. Hargrave
Dust-collector, 2 pats.....A. T. Noe
Dyeing-machine.....C. J. McNamara
Dynamite and other explosives, Means for detonating.....F. Wells et al
Dynamo-ventilator.....D. R. McCullough
Ear-ring fastener.....N. Lieberfreund
Egg carton or carrier.....W. A. Schurmann
Egg-poacher.....A. T. Woodside
Elastic.....B. Lauckner
Electric connector.....J. J. Walsh
Electric-controller lever-check.....J. Thomas
Electric cut-out.....T. E. Murray
Electric-machine air-deflector, Dynamo-.....F. W. Young
Electric-machine, Dynamo-.....E. D. Priest
Electric motor.....L. F. Johnson
Electric regulator.....M. Moskowitz
Electric resistance unit or element.....W. S. Hadaway, Jr.
Electric transmission of intelligence..I. Kitsee
Electrical-distribution system..W. A. Turbayne
Electrode seal, Are-light-.....E. R. Berry
Electrolytic process.....A. G. Betts
Elevator safety device.....A. Linnemeyer
Elevator safety device.....J. Rukonen
Engine-starting device.....S. Dillon et al
Engine steering connection, Traction-.....G. Kirkland et al
Engine steering mechanism, Traction-.....S. S. Rose
Engine stop device.....R. S. Coleman
Envelop, Safety-.....T. Embry
Eye-shade.....S. H. Dice
Fabric.....G. A. Lowry
Fabric-beetling machine.....H. Gray
Fan.....S. A. Price
Fan, Blast-.....F. F. Landis
Fan-blower.....A. T. Noe
Fare-collecting box.....H. W. Charlton
Fastening, Concealed.....E. A. Faller
Faucet.....J. C. H. Voeleker
Faucet attachment.....W. A. Speakman
Faucet, Beer-.....F. E. Brueckner
Feed-bag.....A. Harries
Feed mechanism, 2 pats.....F. H. Richards
Feed-water purifier.....J. Patten
Fence-tie.....W. A. Martin
Filing apparatus.....H. M. Scearce
Filter.....N. G. Goreau
Filters, Packing.....G. Knock
Filtering mechanism.....G. H. Hathaway
Finish-remover.....C. Ellis
Fire door and wall.....A. D. Caywood
Fire-kindler, Automatic.....J. C. St. Clair
Flash-light composition.....C. Bethge
Flat-iron heater.....J. J. McCarthy
Floor-scraping machine.....R. S. La Rue
Flower-pot, Combination.....W. W. Lewis
Fluid motor, Elastic-.....C. J. Lake
Fly-tape.....N. L. Foster
Folding table.....A. Hummel
Food, Stock.....D. McCall
Fountain and aquarium, Combined..R. Glaser
Frame construction.....E. G. Budd
Fuel-economizer.....F. W. Conmey
Funnel.....C. R. Barney
Furnace, 5 pats.....L. L. Knox
Furnace-flue dust, Utilizing.....T. M. Phillips
Furnace-walls, Means for cooling..L. L. Knox
Furnaces, Air and gas port for open-hearth.....F. D. Carney et al
Furnaces, Protecting.....A. W. Allen
Furniture.....H. J. Montgomery
Furniture, Knockdown.....A. G. Seydewitz
Galvanic cell.....F. L. Heim
Galvanic cell, Carbon-consuming..E. W. Junger
Game-board.....W. E. Uhrland
Game-board.....A. T. Flin et al
Gas-burner, Incandescent.....K. Kuppers
Gas-burner safety-cock.....M. Jakobson
Gas-cleaner.....J. Ruddiman
Gas generator, Acetylene.....T. S. Towle
Gas manufacturing apparatus, Water and coal.....H. W. Benner
Gas-meter, &c.....J. Gunning et al
Gas-meter attachment, Prepay...T. J. Martin
Gasolene-burner.....W. Whelan
Gate.....C. A. Eidsmoe
Gate.....G. A. Noble
Gate.....R. S. Brooks
Gear, Change-speed and reversing....L. Wirtz
Gear-shipper for farming and similar machinery.....W. N. Park
Gearing, Power transmission....R. W. Coffee
Gearing, Three-speed transmission-.....R. W. Coffee
Gearing, Transmission-.....D. E. Washington
Glass articles, Machine for making..W. E. Bock
Glass, Ornamenting.....J. Tully
Grading-machine.....C. O. Wold
Grain-grader.....G. H. Rich
Granular substances, Apparatus for grading..R. Moodie
Graphite lubricator, Dry-.....H. E. Walker
Grate, Chain.....F. Taber
Grinding-machine, 2 pats.....E. Sachs
Gun, Automatic.....A. V. P. M. Berthier
Gun sighting apparatus...A. T. Dawson et al
Gutter-hanger.....E. D. Southwick
Gyroscope.....R. G. Haines
Hammer-drill.....D. S. Waugh
Hammer, Pneumatic.....V. E. Lane
Harness-girth.....A. Nicoll
Harrow.....J. X. Mills
Hat-frame former.....C. F. Clark
Hay-press.....J. Fowler
Hay-tedder.....E. J. Loomis et al
Heater.....J. S. Walker et al
Heater.....C. H. Hook
Heating apparatus.....A. Zeck et al
Heating device, Electric.....P. C. Chase
Heating system, Water-.....C. A. Cartwright
Heating systems, Apparatus for hot-water....C. C. Peck
Hinge.....C. L. Brooks
Hinge, Blind-.....J. H. Garber
Hinge, Blind-.....A. Gen
Hinge, Flush.....J. E. Wheat
Hinge, Spring-.....F. Brucker
Hook.....R. P. Standeford
Horse-blanket.....W. T. Lee
Horse-cover.....J. Tilden
Horseshoe.....C. L. Funk
Horseshoe.....J. Kalm
Horseshoe.....T. F. Sexton
Horseshoe.....W. O'Brien
Horseshoe antislipping attachment..A. A. Hill
Horseshoe toe-clip-forming machine.....F. H. W. Rodefeld
Hose-clamp.....J. R. Claney
Hose-coupling.....R. M. Dixon
Hose-supporter.....F. Hirsh
Hot-air furnace or heater.....E. W. Anthony
Hydrocarbon-burner.....A. H. Sievert
Hydrocarbon-burner.....H. C. Ruggles
Hydrocarbons, Treatment of.....E. A. L. Rouxeville
Hypodermic needle.....G. R. Schimmel
Ice-shaving device.....R. Nielsen
Indigoes and making same, Highly-brominated halogen.....A. Schmidt et al
Insulated wires, Instrument for slitting the envelop of twin.....W. J. Courtney et al
Insulating-bushing for electrical service-boxes.....R. C. Cole
Insulating machine, Wire-.....F. D. Platter
Insulating-tile.....F. L. Johnson
Insulator.....B. A. Pond
Internal-combustion engine.....L. G. Sabathe
Internal-combustion engine...H. H. Whitehead
Iron, Making planished sheet.....S. M. Cooper
Ironing-board.....O. W. Mims
Ironing-machine.....F. Kuhnle
Jig.....G. B. Shipley
Jointer and raker, Combined.....J. V. Close
Joist-bridging.....P. E. Bertram
Keg, Powder-.....R. J. Lore
Keyboard instrument, Mechanically-played.....W. Pape
Kiln.....C. A. Wenborne
Kneading-machine.....H. P. Barr
Knife-switch handle.....C. D. Platt
Label-affixing mechanism.....F. O. Woodland
Ladder, Extension step-.....E. M. Hoppe
Lagging.....T. N. Manuel
Lamp attachment, Miner's-.....W. Tunnesen
Lamp-bulbs, Method and apparatus for tabulating.....J. E. Graybill
Lamp, Hydrocarbon-.....M. W. Pitner
Lamp-socket.....J. R. Byrne
Land-roller.....F. L. Gaines
Lantern hell-tube.....W. C. Embury
Lantern, Tubular.....W. C. Embury
Last.....R. Carl
Latch, Rim-.....P. F. Augenbraun
Latex-cup.....J. Webster
Lath-machine attachment, Diamond-.....H. E. White
Laundry-pad.....W. H. Larduskey
Lead, Treating anode slime from the electrolytic refining of.....A. G. Betts
Lever-controlled switch.....M. Hoffmann
Light-fixture, Extension.....C. M. Pitel
Light-stand.....G. W. Hammerschlag
Lightning-arrester or line-disconnector.....I. W. Pedigo
Line-check.....W. H. Fowler
Linotype-machine.....H. Drewell
Linotype-machine.....D. S. Kennedy
Linotype-machine copy-holder.....C. K. Mayer
Liquid-separator, Centrifugal..T. Collins et al
Loading apparatus.....T. C. Ahlbrecht
Lock.....H. W. Simpson
Lock attachment, Combination-..W. O. Johnson
Locking-border, Interchangeable.....J. S. Voorhees
Locomotive spring and equalizer system, Electric.....W. E. Woodard
Locomotive spring and equalizer system, Electric.....W. Dalton et al
Loom.....F. L. Wachtler
Loom attachment.....S. Kendrick
Loom take-up mechanism..T. Nevin (Reissue.)
Looms, Thin-place-detecting mechanism for.....I. Belavance
Lubricant-cups, Cap for.....G. W. Bowen
Lubricant-distributer.....N. McKee
Magnet, Field-.....B. A. Behrend
Magnet structure, Revolving field-.....B. A. Behrend
Mail-bag receiving and delivering mechanism.....W. H. Jones
Mail-box money-holder.....F. Spenner
Mail catching and delivering apparatus.....W. A. Loomis
Mail-slot alarm, Automatic....L. M. Robinson
Manure and dirt loader.....L. C. Peterson
Marking with metallic leaf, Insulated tool for.....H. A. Every
Match-safe.....E. L. Tenney
Measuring apparatus, Bin-.....J. S. Duke
Measuring apparatus, Whey-.....D. Gray
Measuring device, Rotary.....S. Irino
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Clutch, Friction-.....C. K. Tripp
Clutch machine, Electrical-.....W. T. Price
Coal or stone drilling machine.....A. Ball
Coat hanger or suspender.....W. Wall
Coffee-percolator.....J. D. Houck
Coin-controlled apparatus.....F. Magidson
Coin-controlled mechanism....W. M. Probasco
Collar protective shield, Horse-...F. Martell
Collar-supporter, 2 pats.....C. T. Wittstein
Collector-ring.....J. E. Noeggerath
Commode-seat, Sanitary.....H. W. Young
Composing and line-casting machine...B. Cade
Composing-machine.....A. Savarese
Concrete, Float of reinforced.....C. Gabellini
Concrete structure, Reinforced.G. M. Graham
Concrete walls, Apparatus to be employed in building.....R. Bowen
Conduit outlet-fixture.....H. T. Paiste
Conveyer.....A. J. Meyer
Conveyer, Belt.....T. Robins
Conveyer-flight.....W. R. Clarkson
Cork-puller.....A. Baumgarten
Cork-sheet-cutting apparatus.....A. Bogdánffy
Corn-comminuting machine.....F. S. Ulery
Corn-husker.....R. N. Thomas
Corn-husking rollers.....J. A. Stone
Corset, Apparel-, 2 pats.....S. Kops
Cot or bedstead.....G. Holden
Cottage, Outing-.....W. W. Keen
Cotton-picking apparatus.....T. J. Gessman
Cotton-press.....R. E. Haynes
Counting-machine.....G. W. Katzung
Coupling device.....O. Rude
Cradle.....A. R. Clapp
Crane, fire-escape, and similar apparatus.....I. F. Taylor
Crate, Collapsible.....F. M. Crawford
Crusher-balancing means.....O. P. Hood
Cultivator-frames, Adjustable arch and beam-balance for.....E. M. Buckhannon
Culvert, Corrugated metallic.....J. Zelch
Curtain-pole.....J. Hershko
Cutting-machine.....R. A. Lancey
Dead-centers, Device for overcoming.....A. H. Gurley
Delivery mechanism.....W. Scott
Dental appliance.....R. Bradbury
Dental engine.....M. Kelly
Dental syringe.....H. F. Hamilton
Desk-table.....H. W. Bertram
Die-block, Interchangeable sectional.....C. A. Olson et al
Die-supporting block and swager.W. T. Lyon
Display-rack.....W. R. Hayes
Display-rack.....J. G. Huffman
Distilling apparatus.....M. B. Blouke
Distribution system.....F. W. Peek, Jr.
Ditching machine, Tile-.....R. Y. Kessler
Door-bolt or door-holder.....J. P. Holtzhouser
Door-holder.....J. P. Holtzhouser
Door locking device, Emergency-exit-.....F. L. Putney
Door-operating lever, Dump-.....W. H. Yost
Door-stop and supporting box-flange.....W. J. Keene et al
Door structure, Sliding-.....E. C. Pitcher
Dough-molding machine, Long-loaf.F. Streich
Draft device for agricultural implements.....J. A. Dietz
Draft-equalizer.....H. C. Scott (Reissue)
Drag, Flexible road-.....O. H. Gillespie
Drawer-pulls and similar articles, Making....H. J. Bleaking
Dress-shield.....K. E. Allport
Drill-frame, Magnetic.....W. Klouse et al
Drilling machine, Stock-.....E. Childs
Drinking-glass, Electrically-illuminated.....J. H. Cahill
Driving mechanism.....T. E. Drohan
Dry-press, Knee-joint.....J. Schüring, Jr.
Drying apparatus.....R. Grauer
Drying-furnace.....J. C. Kuebler
Drying-machine.....J. Black
Dye and making same, Blue sulfur...L. Haas
Dyeing, Preparation of the indigo-vat employed in.....H. Chaumat (Reissue)
Egg-beater.....S. A. Nicholas
Electric battery, Primary.....G. A. Lutz
Electric-cable terminal.....C. W. Davis
Electric controlling means.....C. S. Reno
Electric demand instrument.....W. J. Lloyd
Electric device, Vapor.....P. A. Huguenin
Electric drive for machines....E. R. Whitney
Electric heater.....G. E. Stevens
Electric heater.....W. C. Fish
Electric light, Incandescent.....W. J. Carpenter et al
Electric machine, Dynamo-.....J. J. Wood
Electric machine, Dynamo-.....W. F. Dawson
Electric machine, Dynamo-.....H. Lippelt
Electric-machine field-pole Dynamo-..H. Poth
Electric motor.....E. F. W. Alexanderson
Electric motor.....R. E. Barker
Electric-power-distribution panel-board.....M. E. Ames
Electric switch.....G. Wright
Electric switch.....C. W. Denny
Electric switch, Automatically-operated.....J. C. Calhoun
Electrical-circuit automatic trunking apparatus.....L. O. Surles
Electrical-distribution system.J. L. Woodbridge
Electrical furnace.....H. Nathusius
Electrical-resistance device.....H. S. Martin
Electrical switch.....F. W. Sanford
Electrical switch.....H. A. Beynon
Electrolytic meter.....G. Hookham et al
Elevating and dumping apparatus.....A. Verschuren
Engine cylinders, System for air-cooling gas-..G. E. Martin et al
Engine-houses, Smoke-jack for railway.....R. J. Evans
Engine starter, Gas-.....G. Buress
Esters, Producing isobornyl.....C. Philipp
Excavating-machine.....G. E. Turner
Excelsior-machine.....W. R. Phelps
Expense-register.....S. Johnsen
Explosive-engine.....C. J. Farrar
Explosive-engine.....M. Tsckimperle
Fabric-roll-edge protector, 3 pats.....G. W. Loughman
Fabrics, Means for attaching plates to.....J. W. Clapp
Fan or blower, Electrically-driven.....E. J. McDuffee
Fan support, Electric-.....E. C. Lipps
Fastening device.....W. Favreau
Faucet jewel-cup.....D. B. Lee
Fence-post mold.....C. B. Bruner
Fence tie, Wire-.....G. A. Scheele
Fence tool, Wire-.....B. B. Wood
File, Letter-.....W. A. Kramer
Filler-strip.....D. J. Kelly
Filling-can.....L. Granda
Filling-carrier or bobbin.....S. W. Wardwell
Film-reeling mechanism.....A. C. Roebuck
Filter.....S. B. Goff
Filter, Continuous vacuum-.....E. L. Oliver
Filter, Milk-pail.....J. F. Horne
Fire-alarm-box attachment...F. A. Dorsey et al
Fire-escape.....J. Hegedus
Fire-extinguisher.....D. W. Diggs
Fish-hook, Artificial-fly.....C. D. Caldwell
Fishing-pole.....J. F. Scanlan
Fishing-rod support.....C. W. Unger
Flax and other fiber-yielding plants, Machine for treating.....E. Bosse
Flower-holding and grave-covering device....J. C. Van Aken
Fluid-controlled mechanism.....F. H. Richards
Fluid-pressure motor.....P. J. Darlington
Fly-catcher.....H. Wiegand et al
Flying-machine.....R. G. Dressler
Form-holding device, Cut-out-.F. W. Van Camp
Fruit-boiler.....E. A. Hall

Furnace....A. L. Yates
Fuse ease, Electric-....T. E. Murray
Fuse, Plug-....H. U. Badeau et al
Fuse, Submerged....C. E. Eveleth
Gage....E. R. Seward
Gage....E. W. Simmons
Galvanic cell....H. P. R. L. Pörscke
Garment, Body-....H. Magnus
Gas-burner....F. Rybar
Gas-burner, Combined upright and pendent mantle....M. W. Pitner
Gas-engine with combined apparatus....W. Heckert
Gas-meter....W. F. Etzel
Gas-meter....H. A. Selah
Gas-producing plant....H. A. Bickerton et al
Gate fastener, Wire-....A. Edwards
Gear, Variable-speed....A. Du Brul
Gear, Yielding....R. L. Raymer
Gearing....E. A. Jeffreys et al
Gearing, Motor-vehicle....F. Everett
Gearing, Reverse-....F. G. Johnson
Gem-setting device....R. Kirkwood
Glove....G. W. Boone
Gold separator, Placer-....T. G. Leavell
Governor, Explosive-engine..W. C. Mayo et al
Governor, Marine-engine....J. Gordon et al
Graining device....A. L. Lawrence
Graphite-lubricator....C. Comstock
Greenhouse-ventilator....G. B. Anderson
Grinder....W. M. Weddington
Grinding and polishing roll...A. H. Whatley
Grinding-machine....J. H. Pope
Gun-carrier....J. Anderson
Gun-sight....J. Y. Bassell et al
Gun-sight....F. L. Putney
Hair-clipper....F. L. Dolan
Hair-dressing device....W. Nowacke et al
Hammer and puller, Combination tack..N. Lund
Hammer button-set, Pneumatic-....A. J. McQuaide
Harness-loop....C. J. Cooper
Harrow....J. M. Larsh
Harrow, Revolving....W. Grafe
Harvester....A. M. Anderson et al
Harvester, Beet-....L. Gettelmann
Hasp-lock, Permutation....J. W. McFall et al
Hat-fastener....W. M. Storer
Hat-saver and hand-bag...A. W. Powell et al
Hay-loader....W. R. McGowen
Head-gear....O. Drexler
Head-rest....A. A. Patnode
Hearse and passenger-vehicle, Combined....F. Hulberg
Heater....G. H. Klumph et al
Heating apparatus, Electrical..W. E. Trümpler
Heating system....H. Lemp et al
Heating system, 2 pats....H. Lemp
Hemstitcher-disk....H. A. Eichorn
Hinge, 2 pats....W. J. Keene
Hinge and supporting box-flange....W. J. Keene et al
Hinges, Manufacturing butt-....G. Weber
Hog-cleaning machine....G. Roth
Hose-clamp applier....W. O. Stein
Hose-coupling....C. E. Loetzer
Hose-coupling....H. R. Mason
Hot-air heater....R. L. Short
Hot-water heater....D. F. Greenawalt
Hot-water or ice bag....C. W. Meinecke
Hydraulic press....R. J. Gibbon
Ice-cream can attachment....C. Harbin
Identification device....J. Walsh
Indicator and advertiser....C. H. Townsend
Induction-motor....H. L. Barnholdt
Induction-motor....S. R. Bergman
Inductive disturbances, Neutralizing....J. B. Taylor
Ink-well....S. B. Smith et al
Innersoles, Machine for applying duck to....A. Schwartz
Insect-exterminator..J. J. and M. E. Cochrane
Instrument-ease....M. S. Chism
Insulating electric conductors...G. H. Rupley
Insulator....F. Schaub
Integrating device and recording-manometer..F. N. Connet
Invoice, Duplicate....F. W. Buffum
Iron, &c., Shearing apparatus for rolled....H. John
Jars and the like, Combined cover and handle for milk....J. L. Kivlan
Jetty or jetty-wall....A. E. Smith
Jointer....J. Herzog
Keg, Nail-....P. P. Hansen
Key, Cotter-....F. S. McWhorter
Key-fastener....E. J. Pepper
Kiln....F. Macarthy
Kinetoscope dissolving-shutter...J. H. Crosier
Kitchen-rack....L. A. Lemke
Kite....F. E. Jackson
Knitting-machine....R. W. Scott
Label and address holder, Reversible....T. J. Whelan
Label for bread, &c., Edible....C. Loesch
Labeling-machine wiper....F. O. Woodland
Lamp-bracket....R. G. Du Bois
Lamp, Electric glow-....H. Remané et al
Lamp, Gas-....J. A. Brandt
Lamp, Gas-....A. C. Noad
Lamp heat, Shelf for utilizing...L. C. Brown
Lamp, Incandescent....H. R. Sargent
Lamp, Incandescent gas-....M. Herskovitz
Lamp mounts, Machine for making incandescent-....I. E. Graybill
Land-roller....C. H. Slankard
Lantern....W. S. Hamm
Lantern-burner....W. S. Hamm
Lap-robe....H. T. von Frankenberg
Lasting device....J. D. Castellani
Lasting machine, Boot and shoe....J. C. and B. Wright
Lavatories, baths, &c., Overflow and waste plug or valve for....J. Clifford
Lawn-sprinkler....L. G. Loomis et al
Leaf-clip and line-marker....E. A. Bagby
Lever mechanism....L. S. Chadwick
Lifting device....F. B. La May
Lifting-rod holder....G. A. Farley
Lightning-arrester....W. Gifford
Linoleum material, Manufacturing blocks of..G. Frenkel
Linotype-machine....C. Albrecht
Linotype-machine....J. R. Rogers
Lister attachment....S. E. Brown
Loading device....W. F. Lenhard
Lock....W. Noville
Lock....H. W. Simpson
Lock-switch, Electric-meter...W. S. Cord et al
Locomotive-cabs, &c., Guard or protector for..T. J. Quirk
Locomotive driving-wheels, Hub-plate for....F. H. Smith
Loom, Automatic filling-replenishing feeler-...W. F. Draper et al
Loom picker-stick check....A. E. Rhoades
Loom-shuttle....F. Renzo
Loom shuttle, Automatic filling-replenshing-..W. F. Draper et al
Mail-bag catcher....A. C. Ergler
Mail-bag catcher or transferrer....G. J. Meier
Mail-box....O. R. Hanchett
Mail-delivery apparatus....G. L. Krinke
Mail-distributing apparatus, 2 pats...W. Barry
Mail-pouch....J. A. McCraw
Mail-pouch catcher....J. Anderson
Mail-pouch catching and delivery device....G. M. Foley
Mailing-tube....H. L. Gray
Mangle....C. Stastka
Marking agent, Composition of matter to be used as an indelible....G. Wild, Jr.
Match-box....C. S. Robinson
Match-box....A. C. Lichtendorf
Match-box holder....J. M. Merrill
Measuring and marking apparatus, Fabric....G. Brauchlin
Measuring and sacking device...C. J. McDuffie
Measuring apparatus, Fabric-....G. Brauchlin
Measuring device, Liquid-....P. J. Peterson
Measuring speed of moving craft or vehicles, Device for....E. H. Fahrney
Micrometer-gage....C. R. Pietsch
Milk and cream can....W. F. Schuman
Mines, &c., Elevating appliance for use in..K. Teichmann
Mold-making machine, Sand-....E. J. Lahan
Mop-wringer attachment...W. F. McGlaughlin
Motive power, Particularly for use in starting machinery and for similar purposes, Application and distribution of electric....G. W. Mascord
Motor control, Induction-....F. E. Case
Motor-control system....A. H. Armstrong
Motor starter, Electric-....W. C. O'Brien (Reissue)
Motors, Squirrel-cage rotor for electric....E. Heitmann
Mowing-machine....H. Savage
Multiple drill....C. H. Oslund
Music-leaf turner....D. James
Music-leaf turner....T. H. Leving
Music-leaf turner....S. B. Thompson
Music-leaf turner....C. Auberlin
Musical instruments, Mechanism for holding and driving music-carrying rolls for mechanical....C. E. Merrill
Nail-driving machine....W. R. Barclay et al
Nailing and slugging machine jack..W. H. Cuff
Nailing apparatus....M. Brock
Necktie....C. I. Person
Night-lock....H. R. Towne
Nut-lock....W. D. Wilkinson et al
Nut-lock....H. W. Worthington
Nut-lock....J. Hauck
Obsterical instrument....W. M. Thomas
Odometer and speedometer, Combined....R. G. Sanford
Oil, Means for reducing the freezing-point of....W. R. Whitney
Oils, Manufacture of lubricating and anti-corrosive....F. W. Klever
Optometer....H. Smith
Ores, Testing or reducing....E. P. Welch
Oscillograph....L. T. Robinson
Oven-door....F. Uhtbrock
Ovens, Means for heating bakers'..F. Trachsler
Overhead-washer....I. J. Smith
Ozone, Apparatus for the production of....A. Vosmaer
Ozonizer....A. Lohman
Package-fastener....H. T. Andrew
Package, Shipping-....J. G. Reber
Packaging and bag-forming machine, Combined....J., C. H., and A. Day
Packing, Metallic rod-....J. Badeker
Padlock, Keyless....O. J. Blakesley
Paper-bag-making machines, Cutting mechanism for....E. F. Müller
Paper-box machine....L. C. Maltby
Paper clip or fastener....I. S. McComb
Paper fastener or clip....I. S. McComb
Paper-piling apparatus....J. Nuttall et al
Paper twine, Machine for the manufacture of....J. Dymock
Paring and cutting knife....W. A. Lindsay
Pavement....R. S. Blome et al
Perambulator....A. E. Robotham
Pianissimo device....J. D. Pease
Piano-bench, Adjustable....A. A. Duff
Picker-stick....H. Coté et al
Pile structure....H. C. Holmes
Pipe connection....J. A. Miller
Pipe-coupling....L. C. Robinson et al
Pipe-hanger beam-clamp....J. H. Doran
Pitman....J. Dain
Pitman-drive....A. M. Anderson et al
Pitman-head....E. C. Wilson
Planer-head-adjusting means....H. B. Ross
Planing-machines and other reciprocating tools, Electrical apparatus for working....A. D. Williamson
Planter, Check-row corn-....N. C. Broderson
Plow-bolt....S. J. Atkins
Plumb, level, degree-finder, and surveyor's instrument....M. Hastings
Pneumatic-despatch-tube apparatus....L. G. Bartlett
Pole, 2 pats....W. and C. Roberts
Post anchoring-base....P. T. Bailey
Powder-box....H. J. Dierking
Precious metals from their ores, Extracting...W. L. Imlay
Pressure-regulator....B. Zindel
Printers' materials, Holder and separator for storing and separating....I. I. McDonald
Printing-machine, Rotary...H. J. Salmon et al
Projectiles, &c., Device for testing the weight of....A. Rapp
Protector, Individual....F. B. Cook
Pruning-knife....S. Szekfü
Pump....J. B. and P. L. Boulicault
Pump, Centrifugal....S. A. Huntley
Pump-operating mechanism....W. F. Siggel
Pump or compressor, Air....C. O. Sobinski
Pump-piston expanding device....S. Gautsche
Pump-spout....J. O. Hutchison
Pumping mechanism, Well-....J. T. Callanan
Pumping valve mechanism....E. A. Stubler
Punch, Can-....W. P. Armstrong
Pyrometer....C. B. Thwing
Quilling-machine....G. Adsit
Rail-bond....G. H. Hill
Rail clamp and tie-plate, Combined guard-....G. L. Mansfield
Rail fastening, Cushioned-guard-..E. J. Shoffner
Rail-joint....S. P. McGough
Rail-joint....J. Crooks
Rail-joint....S. Gins et al
Rail-joint, Insulated....J. C. Jones
Rail-joint, Interlock continuous....T. A. Nicholson et al
Rail-joint truss-support....L. Mueller
Railway-apparatus control....L. A. Hawkins
Railway frog and crossing....E. R. Kent
Railway-rail joint....O. V. Berkley
Railway, Suspended....L. Hinderland
Railway-switch....A. Casale et al
Railway-switch....C. W. Reinoehl et al
Railway-tie....W. Lenihan
Railway-tie....M. Joachimi, Sr.
Railway-tie....J. Klusmeyer
Railway-tie and rail-fastener..P. E. Fetter et al
Railway-tie and rail-fastener..R. C. Shay et al
Railway-track structure....W. D. Peaslee
Railway-trains, Apparatus for the control of..P. Utne
Ratchet-drill....J. R. Gilman
Razor....H. C. Hart
Razor, Safety-....E. D. Becker
Razor, Safety-....S. Korper
Razor, Safety-....J. J. Meehan
Receptacle and closure therefor..B. M. Eaton
Recording and printing meter, 2 pats....H. A. Selah
Recording instrument, 2 pats...W. H. Pratt
Reducing mechanism....A. A. Day
Reflector....E. Schmitt et al
Relay....G. H. Hill
Relay....F. L. Dodgson
Releasing mechanism....F. Gundorph
Reversing mechanism....J. Esser
Rheostat....H. E. Heath
Rheostat, Starting-....P. H. Zimmer
Rifles, Stock-magazine for single-shot....W. J. Rodgers
Rivet-machine rise-and-fall motion....E. S. Ingraham
Rock-breaker, Subaqueous....B. H. Coffey
Rock-chisel machine for channel-excavation....W. D. Cuthbert
Rotary engine....E. B. Trescher
Rotary engine....A. Crull
Rotary machine....L. J. J. Le Rond
Safe, Kitchen-....I. E. Stephens
Salt-cellar....W. E. Snediker
Sash-cord socket....F. Degiorgis
Sash, Means for attaching glass to window-...G. B. Kohler
Saw, Drag-....D. J. Shea
Saw-filing machine....F. A. Blain
Saw mill, Horizontal band-...H. G. Dittbenner
Saw-tension device, Band-...H. G. Dittbenner
Scale....H. Aue
Scale, Platform-....A. Petrowsky
Scenery for theaters, Stage-....A. Bernardi
Screen-plates, Making....E. J. Welch et al
Screw, Packing-....H. H. Bales
Seal....E. J. Brooks
Seal-lock....E. L. Christian
Seal, Mechanical....F. P. Pfleghar
Seal, Snap-....E. J. Brooks
Sewing-machine, Gas-mantle....L. Geabart
Sewing-machine-scale attachment....H. Theiss
Shade and curtain bracket, Adjustable....F. W. Drish
Shade-bracket and lace-curtain fixture, Combined....A. Witzal
Shade hanger, Adjustable window-..J. Osborne
Shade-roller wrench....W. A. Fox
Shaft-centering device..R. J. Bustillo y Diego
Shafting-lubricating means....J. Barry
Sharpening and shaping machine, Rock-drill..C. J. Smith
Sharpening device....A. J. Sturm
Sharpening machine, Rock-drill-...C. T. Smith
Shears....L. T. Slaughter
Sheet-metal box....M. Kamenstein
Sheet-metal vessel....M. Kamenstein
Shelving construction....R. R. Belcher
Shock-lifter....J. P. Smith
Shoe-polishing machine....F. Magidson
Shovel for handling coal....O. C. Goulet
Show-case and stand, Umbrella....A. and G. Davidson
Sign....O. Boehm
Sign, Changeable-letter....J. P. Bryan
Sign, Illuminated rotary....E. Rappaport
Signaling system, Electric...S. M. Young et al
Singeing-machine....T. Allson et al
Single-phase motor....F. Eichberg
Skirt-marker....J. L. McKissock
Slimes in ore concentration, Method and apparatus for saving....J. N. Flood
Snap-fastener....T. R. Hyde, Jr.
Snow-melting machine....G. Dubois
Soap-holder....L. M. Pitsch
Solenoid....C. J. Anderson
Solutions, Concentrating....E. Monti
Sound-reproducing machine....L. T. Haile
Spark-plug....A. A. Davis
Speed-changing mechanism....L. Chevrolet
Speed-controlling device....J. W. Jones
Speed indicator and recorder....A. E. Voss
Speed-recorder and curve-drawing instrument..L. T. Robinson et al
Speed reversing mechanism, Variable-....C. E. Henriod
Spinning, doubling, and twisting machines, Lappet or thread-board for....J. W. Cook
Spinning-machine thread-board cleaner....R. W. Eaton
Spinning-machine thread-guide....J. W. Cook
Spinning or twisting machine roving-clamp....L. T. Houghton
Spinning-ring-holding apparatus....G. L. Pierce
Spittoon-carrier....K. Hilckmann
Spool-head....L. T. Houghton
Spouts, Conductors, &c., Machine for making elbows for....C. B. Agar
Spring-wheel....W. J. Storrs
Springs, Machine for squaring ends of spiral..C. W. Peck
Square....E. A. King
Stair, Metal....C. F. Steiber
Steam-boiler....W. A. Berry
Steel, Refining....O. Thallner
Steel, Tool....J. M. Darke
Steering-wheel....E. S. Bryant
Sterilizer....A. J. Gero
Stocking-shaping-board holder....F. C. Winkelspecht
Stone blocks, Mold for forming artificial-....E. M. L...
Stove....M. M. D...
Stovepipe-cleaner....F. B. Th...
Strainer....W. H. W...
Strap holder, Hitch-....W. W. Plow...
Stropping-machine....J. Lorenz...
Stud or button....A. Herm...
Suction-box....J. Whit...
Support, Adjustable....J. A. Wald...
Surgeon's glove....H. W. Warre...
Surveying or leveling instrument..W. Nugent
Suspensory....G. C. Johnson
Switch and cut-out, Combined...H. R. Sargent
Switch-signal....R. B. Cunningham
Switch-throwing, track sanding, and sweeping device, Automatic....S. A. Johnson
Syringe....P. J. McElroy
Tack-separating device....F. I. Redemann
Tank....A. R. Beal et al
Target-carrier....W. P. Pinkston
Target-practice apparatus....H. H. Cummings
Telegraphic transmitter....P. Dinger
Telephone apparatus....C. E. Bilton
Telephone cut-out and lightning-arrester....W. E. Ashby
Telephone jack-box....J. B. Taylor et al
Telephone party-line switching apparatus....A. J. Farmer
Telephone-register....W. O. Weissich
Telephone-switchboard cable....W. L. Runzel
Telephone-switchboard clear-out system....K. Weman et al
Thermostatic regulator....C. J. Balthasar
Three-position signal....W. V. Moak
Threshing-machine leveling device....F. W. and E. P. Gross
Tie-plate....L. A. Hopkins
Tin, Removing and recovering....J. Elkes
Tipple....J. L. Green
Tire, Cushion-....C. Weiland
Tire, Pneumatic....J. T. Kennelly
Tire protector and reinforcement, Pneumatic-...W. J. O'Neil
Tire-repairing apparatus, Pneumatic-....W. J. Stark
Tire-shield....A. V. Nutt
Tire, Vehicle-....J. Lend
Tobacco-box....I. J. Marcuse et al
Tobacco-box, Sheet-metal....G. W. Weber
Tobacco-box, Sheet-metal pocket...F. Rudolphi
Tobacco-box, Sheet-metal pocket..G. W. Weber
Tobacco-pipe, Magazine....C. A. Allen
Tongue-truck....A. C. Dann et al
Tool, Combustion....A. B. Schofield
Top, Gyroscopic....M. L. Hawks
Toy, Locomotive....D. P. Clark
Trace-support and skirt-end loop, Adjustable...H. M. Dingsley
Tracker mechanism, Double....T. P. Brown
Traction device and emergency-brake, Electro-magnetic....C. A. Wells (Reissue)
Transformer....J. I. Frank
Trap....J. J. Donovan
Trolley....J. T. Minahan
Trolley-wheel bearing....A. C. Sloan
Trolley-wire clamping-ear....F. Guillot
Trolley-wire support....J. W. Porter
Truck-bolster and car-truck....J. J. Byers
Truck-brake....J. S. McWhirter
Truck, Car-....A. F. Batchelder
Truck for harrows....W. H. Parlin
Truck for harvesters and other machines, Short-turning two-wheeled tongue-..W. M. Wadleigh
Truck, Hand-....G. R. Parker (Reissue)
Truck, Maximum-traction....W. S. Adams
Truck, Railway-car....W. F. Richards
Truck side frame, Car-....J. H. Baker
Tube....W. F. Murphy
Tuck marker and folder, Combined....W. R. Parsons
Turbine....C. Lemale
Turbine, Elastic-fluid....I. S. Green
Turbine, Steam-....J. D. Fraivillig
Turbo-generator....B. H. Hamilton et al
Type, Machine for composing or setting up...H. Weiniger
Type setting-up and casting machine....E. M. M. Retaux
Type-writer, Electrical....H. C. Horstmann
Type-writer's copy-holder....W. P. McNatt
Umbrella and parasol notch or runner-head...J. B. Riehl
Umbrella, Stick-....R. Genck
Universal joint....C. W. Spicer
Valve....D. T. Williams
Valve, Air-....V. C. Washburn
Valve attachment, Radiator-....P. R. Moses
Valve, Balanced....W. Ord
Valve-controlling mechanism....P. L. Wormeley, Jr.
Valve, Discharge-....O. S. Sleeper
Valve, Double-seated....F. M. Smith
Valve for the supply-pipes for water-motors, Relief-....H. E. Warren
Valve, Motorman's....B. Lewis
Valve, Relief-....E. V. Anderson
Valve, Steam-engine....E. Dugar
Vapors issued from volatile liquids, Apparatus for recovering....H. Diamanti et al
Vault....G. W. Bonnell
Vegetable-washer....A. Williams
Vehicle....P. Forschler
Vehicle attachment, Self-propelled-....J. Wood
Vehicle-wheel....T. B. Jeffrey
Vehicle-wheel....W. H. Clausen
Vehicle-wheel designated as double safety bolster-wheel....L. Clark
Vending apparatus, Card-....B. Neumann et al
Vending apparatus, Coin-controlled....T. R. Chisolm
Vending-machine....E. N. Somers
Vending-machine....H. H. Daniels
Vending-machine....A. Merckens
Vending-machine coin-controlling mechanism...N. D. Nelson
Vessel, Double-walled....M. Anacker
Vessels, Apparatus for cleaning the hulls of...F. Otidys
Vibration-neutralizer....F. I. Jolivet
Vibrator....H. M. Seiple
Violin and like stringed musical instrument...M. B. Hern
Vise, Hand-....I. G. Smith
Voting machine, General-....L. R. Winslow
Voting mechanism for voting-machines, Independent-....L. R. Winslow
Wagon brake or lock....F. G. Wetzel
Wagon-coupling....S. A. Biggers
Wagon, Dump-....O. C. Seelow
Wall-bracket, Adjustable...R. B. Savin et al

Washbench....W. J. Holly
Washboiler....E. L. Ridgway
Washing-machine....J. M. O'Neall
Watch-glasses and grooves and fillets, Gage for....A. Guérineau
Watch, Stem winding and setting.W. E. Porter
Water-closets, Coupling for the flushing-pipes of....H. Oidtmann
Water-craft....J. S. Chase
Wave-motor....A. T. Newman
Waxing-pad and iron-holder, Combined....V. F. Good
Weather-strip for windows....J. E. Williams
Weaving cut-pile carpets, Jacquard mechanism for....J. R. Baker et al
Whip socket and lock, Combined..T. K. Scott
Winding and drying reel....S. M. McMurray
Winding machine, Edgewise-....J. J. Wood
Window....J. Austin
Window, Automatic....J. Austin
Window-fastener....E. Bollbach
Window-holder and weather-strip.J. Davis et al
Window-lock....A. G. Neumeister
Window-lock, Self-locking.T. L. Thomas et al
Wire-coating machine....G. H. Rupley
Wire-covering-machine tension device.D. Noble
Wire-joints, Tool for twisting....C. E. Cook
Wire staple....W. H. Page
Wire-stretcher....O. Phillips
Wire-stretcher....E. Edwards
Wire stretching and splicing device....P. O. Larson
Wire-twisting machine....L. Blessing
Woodworking-clamp....F. W. Nichols et al
Woven fabric and producing same....S. J. E. Solley
Wrench....G. L. Hindman
Writing a plurality of signatures or inscriptions, Means for simultaneously..J. S. Brand
Zinc compounds and ammonia, Apparatus for recovering....E. G. and M. M. Pearlman
Zinc compounds and ammonia, Recovering....E. G. and M. M. Pearlman

DESIGNS.

Badge....J. J. Coccaro
Bedstead....H. H. Hirsch
Braid....F. Doebeli
Clock-case....P. G. Giroud

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MECHANICAL PATENTS.

Abrasive bodies having a porcelain base, Fastening for....C. Jung
Abrasive wheel....H. L. Slager
Acetylene-generators, Feeding means for....J. M. Morris
Acid, Manufacturing nitric...F. S. Valentiner
Acid, Strontium salt of dibrom-behenic....E. Fischer
Adjustable wrench....O. C. Caldwell
Air-brake....F. B. Rae
Air-engine....A. E. Smith
Air-purifying apparatus....K. Kosak et al
Air-ship....J. Sinkovits
Air-ships, Winged propelling and guiding mechanism for....J. U. de Uherkocz
Aluminum and other metals, Extracting....H. S. Blackmore
Amalgamator....G. H. Loucks
Amusement device....W. P. Hayes
Animal-trap....I. Lawrence
Automatic switch....A. W. Schramm et al
Automatic switch....J. T. De Moss
Automobile sparking mechanism...G. S. Hill
Awning....W. Sullivan
Awning-support and lock therefor....J. C. McNamara
Axle-spindle, Self-lubricating....E. W. Hanna
Badge or ribbon fastener....A. O. Paulson
Bag-case....J. Oliver
Bag-fastener....L. Kaestner
Baker-s peel....F. Schumacher
Ball used for golf and like games..J. H. Roger
Banding-machine....C. Wagner et al
Basket....J. B. Kenny
Bath-tub....C. F. Ike
Bean-sorter....O. Sutter
Bearing, Ball-....C. R. James
Bearing, Car-axle....G. A. Woodman
Bed and douche pan....D. Hogan
Bed-pan....M. E. Stoers
Belt, Metallic....H. L. Canne
Bicycle crank-hanger....C. F. Kline
Bicycle support or stand....E. H. Stayt
Binder, Temporary....E. P. Impey
Binder, Temporary....G. C. Shepherd
Blacking and polishing machine, Shoe....J. C. C. Scheer
Blank-shaping machine....C. W. Graham
Boat, Hydroplane-....W. H. Fauber
Boats, Electrical-current connection for....E. Weström
Bobbin marking and coating machine....F. C. Hodgman
Boiler....M. Kelly
Boiler....H. O. Keferstein
Boiler-flue connection....D. B. Hines
Bolt-locking mechanism, Split..W. W. Parsons
Bookcase, Collapsible....J. H. Scott
Bottle-closure....J. Meljsch
Bottle-closure....G. Waldmann
Bottle-molds, Turn-table for....M. Nester
Bottle-neck-forming tool....W. S. Dorman
Bottle, Non-refillable....A. L. Rudolph, Jr.
Bottle, Non-refillable....M. Loftus
Bottle or receptacle, Heat and cold non-conducting....P. O. E. Friedrich
Bottle-soaking machine....S. L. Goldman
Bottle-stopper....C. A. Hunt, Jr.
Bottles, Means for extracting the contents of..A. J. Farmer
Box-cover fastener....C. W. Ridpath
Braiding-machine....G. W. Sears
Braiding-machine....W. T. Le Blanc
Brake-head....J. M. Coleman
Brake mechanism, Load-regulated....H. H. Forney et al
Brake-operating device....O. Pfänder
Brakes, Apparatus for adjusting railway-vehicle and like....V. Chaveriat
Breeching-strap fastener....L. C. Freeman
Brooch or the like....C. G. Armstrong
Brooder, Poultry-....H. N. Heilman
Brush, Air-....L. Forester
Brush-machine....H. J. Lebherz
Brush-making machines, Bristle-feeding means for....W. G. Liebig
Buckle for compressed bales....E. L. Hines
Building-block and wall constructed thereof..S. Strong
Bundle-forming machine....A. J. Chesson
Burglar-alarm....W. N. Fawcett
Burglar-alarm....H. Spencer
Burner....J. J. Kelly
Butter-merger....B. N. Hawes
Button for cushion-seats, Tufting-..L. A. Young
Button, Separable....E. Noelle
Buttonhole-cutter....C. Anderson
Cabbage-core shredder....H. D. Wilson
Cabinet, Douche-....S. Van Denburgh et al
Cabinet, Filing-....J. J. Atkinson
Cables through pipe-lines, Device for passing..H. A. Greenan
Calculating-machine....A. A. A. Dreyfus et al
Camera enlarging attachment....C. F. Adlon
Camera-stand, Photographer's...J. E. Harrod
Can-filling machine....H. A. Blakeslee
Can-filling machine....G. H. Mallett
Can-making machine....E. Ellefsen et al
Can top, Powder....A. M. Coons
Canning-table fruit-distributing apparatus....W. C. Anderson
Car....R. Dunning
Car construction, Passenger-....G. W. Lillie
Car-door-operating mechanism, Electrically-controlled street or railway....H. Rowntree
Car, Dump-....T. R. McKnight
Car, Railway steam motor-....T. H. Curtis
Car-underframe....A. E. Ostrander
Car-underframe....A. Becker
Car underframe, Freight-....W. J. Lage
Cars, Controller-checking device for street-railway....N. Fallek
Cars, Rotary wheel-guard for..F. E. Hutchings
Carbid, Treatment of....A. R. Frank
Carbureter....J. W. Wood
Carbureter, Automatically-governed.O. Pfänder
Carbureter for internal-combustion engines....H. Z. White
Carding-engine....E. Gessner
Carpet-rug beater....A. F. Mewis
Cartridge belt or bandoleer...F. R. Batchelder
Case or cabinet having sliding doors....C. F. Kurz
Cash-register....J. P. Cleal et al
Cask-making machine....J. Gilmour
Caster, Adjustable....J. Sharon
Casting blocks and other pieces, Diminishing the formation of flaws or blow-holes when..A. von Paravicini
Casting machine, Line-....J. McNamara
Ceiling construction, Metal-....R. Goho
Cellulose material, Making...C. F. Cross et al
Cement-burning apparatus....H. S. Spackman
Cement posts, Wireholder for....P. Wachtel
Chain grip systems, Switch for automatic cable....G. S. Fouts
Chain-motor....L. W. Merriam
Chair....A. H. Clark
Chair attachment, Rocking-....N. Evans
Change-making machine....L. J. Dittmar
Cheese, &c., Apparatus for determining the amount of moisture in...J. W. Mitchell et al
Chimney-hood, Adjustable....S. Neiburger
Chuck, Self-tightening rock-drill....J. A. Thompson et al
Churn....W. L. Pratt
Cigar cutter and cleaner....H. Saul et al
Circuit-breaker....L. C. Steele
Clamp....T. Lucier
Clock winding mechanism, Electric....F. H. Feraud
Clutch....T. F. Philippi
Clutch, Interlocking friction-....F. B. Smith
Clutch mechanism....Z. P. Candee
Clutch mechanism....J. F. Duryea et al
Coat-hanger....S. W. Bonsall
Coffee-roaster....E. E. Burnham
Coin-receiver....M. W. Piper
Coke-ovens, Regenerator system for by-product....H. Prentice
Collar-support....J. Kelley
Compass....A. Laube
Compasses or dividers....C. E. Hand
Concrete-block machine....L. Flanagan
Concrete construction....C. F. Lancaster
Concrete culverts and bridges, Portable mold for....A. J. Fisher
Concrete-mixer....C. E. Bathrick
Concrete pipe, Mold for making cement....H. H. Gardner
Condenser....H. Lemp
Conduits, Device for removing obstructions in..T. J. Cope
Conduits for electric wires, Connector for....G. E. Neuberth
Conveyances, Impelling mechanism for....B. F. Seymour
Cooker....P. G. Hubert
Cooker, Fireless....P. G. Hubert
Cooking apparatus, Heat-accumulator for self-..E. Blasberg
Crane, Ladle or double-trolley electric....C. L. Taylor et al
Crate, Banana-....L. D. Fowler
Crate, Folding....L. E. Lane
Crate, Folding....W. N. Luft
Crate-side machine....J. Eklund
Cream-separator, Centrifugal...P. L. Kimball
Cultivator or harrow frame....T. C. West
Current-collecting apparatus..J. E. Noeggerath
Current motor, Alternating-....F. F. W. Alexanderson
Curtain-support....E. S. Dinkel
Cuspidor....W. C. Bridges
Cutter-head....M. H. Dette
Damper for feeding air to combustion-chambers, Smoke-flue....G. I. Munson
Damper, Stovepipe-....J. M. Tribur
Darning out-fit....S. S. Neely
Dash-pot....O. B. Blankenship et al
Decoration, Interior....H. C. Leslie
Dental castings, Appliance for making....A. P. Lee
Dental cuspidor....M. N. Callender
Dental-inlay-casting machine..E. M. Fredericks
Dermal-treatment apparatus....H. Behm et al
Disinfecting device....G. W. and C. W. Allen
Display and cover attachment for barrels, casks, or other receptacles, Sanitary....L. F. Kaltwasser
Display apparatus, 2 pats....E. F. Cannon
Display-rack....E. A. Cummings
Display rack, Garment-....B. Siegel
Distillation-furnace....W. M. Johnson
Dock, Floating dry-, 5 pats...W. T. Donnelly
Door-locking mechanism, Emergency-exit-....P. H. McEwan
Door-closing mechanism, Sliding-.W. Keating
Door-spring....O. Gunther
Dough-mixer....A. Marchand
Draft attachment, Wagon....W. F. Schoepflin
Drag, Road-....D. C. Boyd
Draw-box....E. H. Rooney
Drill-press work-holder....P. E. Reece
Drinking-fountain....C. A. Carothers
Drying-machine, Hot-blast....W. H. Lamb
Dye, Trisazo....H. Jordan et al
Eccentric....R. M. Clark
Egg-tester....D. W. Hopkins
Electric conductors, Perforated block for....F. R. McBerty
Electric-lighting system....J. L. Creveling
Electric machine, Dynamo-...J. E. Noeggerath
Electric machine, Dynamo-...W. L. R. Emmet
Electric machine, Dynamo-...H. F. T. Erben
Electric machines, Cooling dynamo-....J. G. Callan
Electric machines, Pole-piece for dynamo-....L. E. Underwood
Electric motor, Reciprocating...C. W. Tremain
Electrical appliance....J. S. Stewart
Electrical-power distribution, Panel-board for....A. C. McWilliams
Electrical protective device....C. A. Rolfe
Electricity-meter, Changeable-rate....A. Nicol
Elevating device....A. F. Meyer
Elevator....C. H. Ocumpaugh
Elevator safety device....P. H. Costello
Elevator safety-lock....E. J. Brown
Embroidering-machines, Tension device for the thread-delivery rollers in....R. Zahn
Engine....L. H. Marcil
Engine starting device, Explosion-....H. C. Bailey
Engine starting device, Explosive-...J. Zagora
Engine steering-gear, Traction-....F. T. Finchbaugh
Engines, Timing device for explosive-....A. Lamont et al
Envelop-fastener....J. H. Husted
Etching-machine....L. E. and M. Levy
Examination, operating, or treatment table....E. W. Thomas
Expansion-tank....J. R. Shanklin
Explosive-engine....J. W. Smith
Explosive-engine....M. Berliet
Eyeglasses....E. H. Schild
Fabrics, Apparatus for stretching textile....F. Farnworth
Face-bleach....E. J. Clark
Fair leader....E. D. Roberts
Fare receipt, Railway cash-....G. M. Rose, Jr.
Faucet, Dispensing-....E. E. Murphy
Feed-box....J. M. Hannibal
Feeder, Poultry and hen....J. D. O'Connell
Feeder, Stock-....C. A. Wright
Fence-post, Composition....C. J. Welty
Fence stay-wires, Apparatus for applying....W. W. Hardy
File, Bill-....E. M. Shreiner
File, Bill-....J. G. Henderson
File, temporary binder, loose-leaf book, &c....J. Walker, Jr.
Film-developing machine....R. L. Burton
Filter, Metallurgical....J. H. Edges et al
Fire-bar-tilting mechanism....W. R., T., Jr., P., and H. A. Peat
Fire-escape....N. Slavin
Fire-escape....T. B. Erwin et al
Fire-extinguisher, Automatic....H. C. C. Kast et al
Fire-extinguisher with expansion device mounted on the discharge-pipe, Chemical..W. Graaff
Fire-extinguishing installation.J. Shepherd et al
Fire-pails and other articles, Safety-locking device for....T. F. Mullaney
Fire-screen....G. A. H. Briggs
Firearm, Automatic....M. G. Farquhar et al
Firearm, Magazine-....T. A. Fidjeland
Firearm-sight....J. C. Hightower, Jr., et al
Firearms, Illuminated sight for....E. O. Deere et al
Firearms, Safety device for the triggers of..H. Stephan
Fishing-tackle box....J. M. Kersey
Flue-cutter....S. T. Boyd
Flue-cutter....A. Frykman
Fluid-pressure brake....W. V. Turner
Fluid-pressure controller....T. O. Perry
Fluid-pressure regulator....C. C. Farmer
Fluid-pressure regulator....A. G. Beckman
Flushing-tank....J. L. Fruin
Flute....H. W. T. Jenner
Fly-trap....H. Turner
Flying-machines, Surface of ascension or aeroplane for....A. P. Filippi
Folding chair or seat....G. E. Remsen et al
Folding table....B. Boeswinkle
Food, Manufacturing cattle....T. E. Breyer
Foot and leg rest....J. Findall
Fuel....J. Gunn
Fuel-briquet machinery....R. Devillers
Furnace....L. S. Hughes
Furnaces, Oil-superheater for steam-boiler....T. W. Heintzelman et al
Furniture-leg fastening....E. Werner
Fuse....H. E. Ellsworth
Fuse, Electric safety-....T. E. Murray
Fuse, Manufacture of....H. E. Ellsworth
Fuse, Projectile-....K. Völler
Game apparatus....E. C. Hinkle
Garment, Adjustable....W. A. Dielhenn
Garment-hanger, Collapsible....I. Anderson
Garment-receptacle....J. Leavy
Garment-supporter....R. Zimmermann
Garment, Union....E. Taylor
Garter-clasp....M. W. Schloss
Gas-burner, Inverted....J. Lederer
Gas-compressor....W. J. Boland
Gas generators, Agitator for carbid-....F. L. H. Sims
Gas-regulator for Bunsen burners....F. T. Williams
Gate....J. Finch
Gate....J. S. Anderson
Gate opening and closing device....J. R. Kerr
Gear, Transmission-....D. G. Welling
Gearing....W. L. Schellenbach
Gearing, Belt-....M. A. Baker
Gearing, Change-speed....H. Salmond
Glass manufacture, Apparatus for..R. H. Bolin
Gluing-machine....W. F. Morse
Gluing, Machine for preparing wood for....F. Diehl
Grain-meter....W. Ross
Granulating-machine....J. D. Hiss
Graphophone....J. H. J. Haines
Grinding-machines, Device for automatically arresting the feed-motion in....F. Schwerd
Grinding or polishing machine...F. N. Gardner
Gun, Automatic....A. T. Dawson et al
Gun, Electromagnetic....E. M. Alderman
Gun-sight....O. H. Lindberg
Guns, Rear sight for....L. W. McGrew
Hair puffs and curls, Device for making....J. A. Davis
Hame-fastener....C. F. Kolb
Hammer....H. J. Augustine
Hammer, Drop-....J. Bêché
Hammer with shingle-cutting attachment....B. M. Wells et al
Hand-bag....P. J. Flanagan
Hand-book....H. A. Waterman
Handling shaped masses of incoherent material, Apparatus for....W. Cox
Handling shaped or molded masses of incoherent material....W. Cox
Harrow....X. T. J. Jones
Harrow....W. A. Kelly et al
Harvester, Corn-....J. A. Stone
Hat-pin....J. N. Bishop
Headlight, Arc-lamp....R. Fleming
Headlight-holder....G. B. Gardner et al
Headlight number-plate holder...C. B. Baker
Heating system, Steam-....R. E. Atkinson
Heel-blank-assembling machine...G. B. Grover
Hinge....P. C. Miller
Hinge, Blind-....G. W. Ellington
Hinge-joint for folding wind screens....A. C. Auster
Holdback, Adjustable....W. J. Thomas
Hoops to casks, Device for applying.J. Gilmour
Horse-whipping device....C. E. Speck
Horseshoe....C. W. Morrison
Hose-rack....W. D. Doremus
Hot-water heater....J. Reesor et al
Hub-fastener....A. E. Roxberg
Hub for wheels, Resilient....A. E. J. Smith
Ice-cutting machine....W. C. F. Michel
Ice-manufacturing apparatus....A. C. Bishop
Ice-scraper....F. Evans
Indigo sulfid and making same, Brominated..E. Kraus
Induction-generator...E. F. W. Alexanderson
Insect-destroyer....H. S. Beahm
Insecticide....B. W. Marston
Internal-combustion engine....J. J. McIntyre
Internal-combustion engine...G. R. Bott et al
Iron or steel by the basic Bessemer process, Manufacture of....J. Flohr
Ironing-board....W. J. Kelly et al
Ironing-board attachment....A. J. Treat
Ironing-table....J. A. Keck
Key-socket, Electrical....C. D. Platt
Knife, fork, and spoon kit....A. Aagaard
Knitted fabric....B. T. Steber
Knitting-machine take-up mechanism....R. W. Scott et al
Knitting-machine web-holder....H. F. Berry
Lacing....G. W. Prentice
Ladder....H. H. Fussey et al
Ladder, Convertible....S. S. Groves
Ladder, Step-....M. Crum
Lamp, Arc-....C. C. Hughes
Lamp-burner....F. A. Satter
Lamp, Electric-arc....C. J. Toerring
Lamp, Miner's....C. B. Rimmel
Lamp, Multiple-arc....W. Mathiesen
Lamp, Vapor-burning....E. J. Parsons
Lantern....C. Bergener
Lantern-frame....F. K. Wright
Lantern-tube....C. L. Betts
Lantern, Tubular, 2 pats....C. L. Betts
Latch, Door-....W. Keating
Lathe attachment....C. W. Wright
Lathe, Crank-axle....J. L. Bogert
Lawn-sprinkler....J. B. Gorrell
Lead, Manufacturing sublimed white....L. S. Hughes
Lead ores, Treating argentiferous....O. H. Picher
Leather-finishing machine....A. G. Filmer
Lens Acoustic....D. Petri-Palmedo
Level....P. J. Bernard
Life-saving and swimming clothing....J. S. Bartholomew
Lifting and spanking machine, Combined....U. S. De Moulin
Lifting-frame....H. Knox
Liquid-distributing apparatus....H. Barber
Liquids with respect to viscosity, Indicator for testing....H. Mikorey
Litharge, Manufacturing....L. S. Hughes
Loader....S. N. Krawchenko
Lock....W. H. Thorp
Lock....F. Di Bella
Lock and check hook....J. C. Backus
Log-loader....J. R. McGiffert
Log-loader....G. N. Lasswell
Logging and hoisting engine..W. H. Corbett
Loom....S. Toyoda
Loom, Circular....A. E. Chernack
Loom picking-stick, Underpick-.W. Bond et al
Looms, Replenishment of filling in automatic..D. M. Hollins
Lubricator....G. W. Nütz
Lubricator....C. W. Manzel
Macpelah or resting place for the dead.L. Barg
Mail-bag catcher and deliverer.R. R. Hedgpeth
Mail-bag catcher and deliverer....M. Nugent
Mail-bag catcher and deliverer....B. F. Troup
Mail-bag catching and delivering apparatus, Automatic....B. K. and A. J. Kauffman
Mail-box....E. M. Shipp
Mail-catcher....L. Palmer
Mail-matter holder....F. R. Jackson
Mail-pouch receiving and delivery apparatus for railway-cars....C. W. Broughton
Mail receiver and deliverer..J. O. Anderson
Manicure implement....R. Wild
Manure-spreader....D. J. Beem
Manure-spreader....T. Brown
Match-box....H. B. Lane
Match-box holder....J. H. Esdorn
Match-making machine...E. J. Young et al
Mattress-protector....F. K. Broadhurst et al
Measuring and filling apparatus, Liquid....H. Adelson et al
Measuring device, Liquid-....H. Adelson et al
Measuring device, Lumber-...W. B. Woodruff
Measuring instrument....E. Hiergesell
Measuring the axial thrust of driven shafts, Device for....C. Thämer
Mechanical movement....F. H. Richards
Metal, Forming expanded....T. H. Kane
Metal plate or rail....J. H. Koon
Metal, Refining....J. H. Reid
Metallic hoop....W. Goldie
Metallic tie and rail-fastener...J. Majors et al

Metallurgical furnace....L. S. Hughes
Meters, Protection for electric..G. R. Radley
Milk and cream saving device, Sanitary.....C. C. Cousens
Milking apparatus....E. E. Good
Miter-box....J. F. Winkler
Mixer feed device....C. E. Bathrick
Mixing-machine....C. Whalley
Mold and casting device, Combined.G. A. Stotz
Mold-fastening device....J. H. Sullivan
Mortise-nail....A. T. Burch
Motor control, Alternating-current-....F. Eichberg
Motors, Electromagnetically-operated interrupter igniting device for explosion-..G. Honold
Motors, Means for cooling electric.....J. B. Wiard
Music-leaf turner....M. L. Keagle
Musical instruments, Body-rest for.....J. W. Hughes
Nail-clencher....P. Deevy
Necktie-holder....P. Lucas
Nozzle....W. G. Hughes
Nut-lock....E. C. Mangin
Nut-lock....F. B. MacDonald
Nut-lock....C. C. Earlywine
Oar-lock support....J. S. S. Bowen
Oil-burner....W. J. Blissonnet
Oil-burner....J. C. Hinz
Oil-burner, 2 pats....W. D. Breckenridge
Oscillating gate....D. Pritchard et al
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(*Continued in July Number.*)

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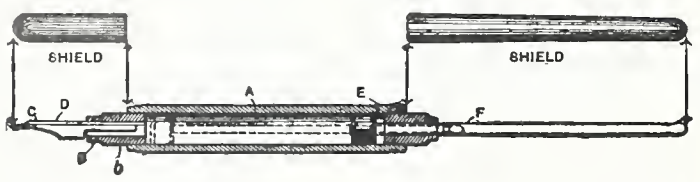
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ELECTRICITY ON THE FARM.

MODERN technical science is being applied with advantage to agriculture. The use of electricity in this field has developed slowly and has come much later than in other branches of human activity, but it is conquering one line of work after another. Especially in the older civilizations of Europe has it been employed. The first thing needed to put electrical appliances to use on the farm is the electricity. This may be produced by the farmer himself in his own power plants, but it is much more practicable and convenient to buy it cheaply of some electric plant in the neighborhood. The electric plants in



ELECTRIC THRESHING.

small cities lie idle during the day time, their supply of current for lighting purposes being necessary only at night. In such plants the current may, as a rule, be had much cheaper than if it were produced in one's own plant.

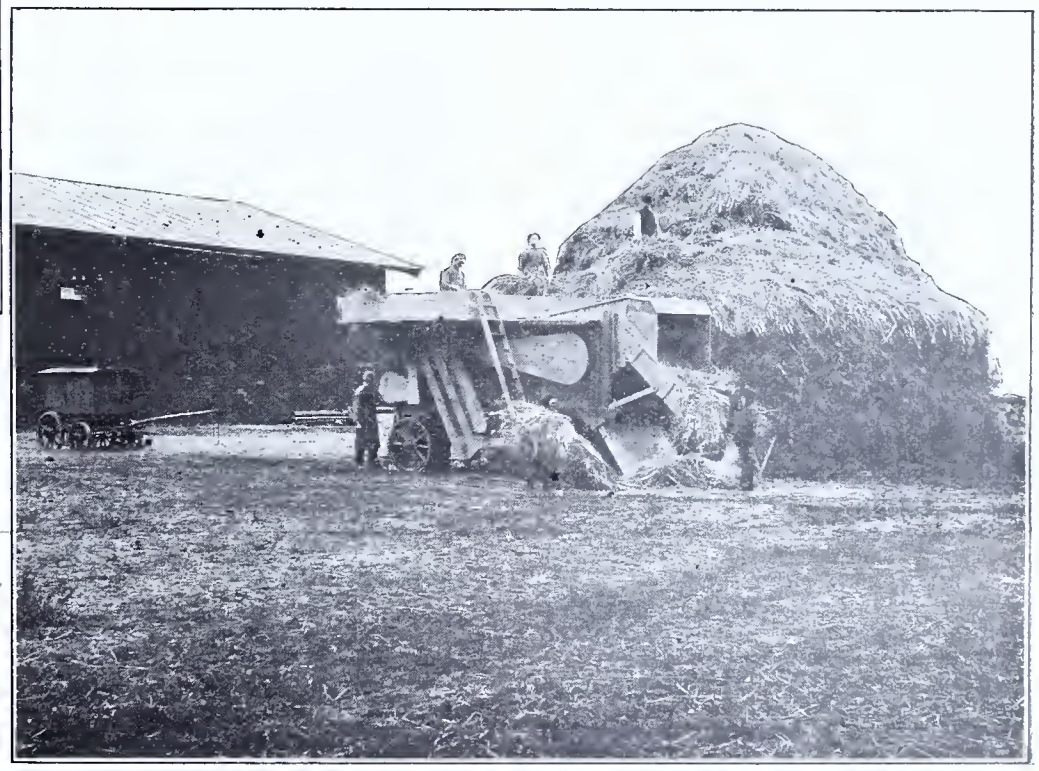
Even if special machinery must be employed for such work, production on a large scale will always be less costly than the production in small power stations on each individual farm, and therefore central power houses, which supply a whole district with electric current for all possible purposes, are widely employed in Germany. The question of distances arising, the electricity in the central station is generally generated in a high-voltage current. In this way it is possible to conduct very large quantities of energy to each of the farms or places where it is wanted by means of wires no thicker than the ordinary telegraph wire.

The high-voltage current cannot be taken into use directly for various reasons, the principal of which is the danger to life. By means of transformers it is rendered harmless, and the low-voltage current is distributed about the farm by means of a special net of conductors. A transformer is enclosed in a small building, and conductors go out from this, while electrical junction boxes are installed on poles in the fields and on the house, the barn, the dairy, and wherever else it may be desired. These junction boxes are similar to those used in connection with the electrical installment in dwellings, etc., where the conducting wire of lamps may be joined to the battery by means of contact connections. The junction boxes used on the farm are, of course, much larger and must be weatherproof, and the connecting wire, instead of being a fine insulated one, must be a strong, pliable cable from 50 to 100 yards long, and may be rolled on a reel like a garden hose. With the junction boxes and such a cable, nearly every spot on the farm may be reached.

Having arranged for the delivery of the current to the desired locations, the next thing to consider is the motor. Its size will depend upon the amount of work to be done, but in all cases the motor must be portable. Two persons can easily carry about a motor which will be used in various places in the farmyard, to drive small machines for house or yard work; it can be easily connected to such machines as chaff cutters, oil cake breakers, draining pumps, corn shellers, grinders, etc. A good manager will use the motor to the greatest advantage in work of this kind.

The farm work in general lasts for only a few months of the year, and for this reason the motors are not permanently connected and may be used throughout the year for all kinds of work, thus deriving the largest possible returns from the money invested. Large motors must be put on wheels. By using belts, these can be used for threshing machines and other work. The illustrations show the operation of electrical threshing machines.

To those accustomed to viewing the inseparable companion of the threshing



ELECTRIC THRESHING ON THE FIELD.

machine, the traction engine, these illustrations will seem rather odd. They represent conditions of threshing prevalent in Germany. The type of threshing machines differs materially from those in general use in this country. One misses the pneumatic straw stacker which is a necessary adjunct of all up-to-date threshing outfits in the United States. The motor is shown to the left in each illustration, being mounted on a truck which can be easily transported from place to place, and it has a belt connection with the

threshing machine to be driven. After the threshing is over, the farmer can use the motor for such other farm work as may be necessary.

Barns are in some places equipped with cranes lifting an entire load of hay at once and placing it in the loft at any desired place. Such an installation means a great saving in farm labor. The power is also employed in connection with chaff cutters, corn huskers, shredders and shellers: also for illuminating the house and barn, and even the barn yard, if it is necessary to do work at night. Pumps, churning machines, saws and other apparatus may be run, and in the fields reapers and plows may be operated as well as the threshing machines.

Life Saving Cage.

A novel but simple and effective apparatus devised for rescuing sailors who have fallen overboard has recently been subjected to interesting tests at Hamburg, with such satisfactory results that the German Admiralty has adopted the appliance. It is described in the *Literary Digest* as a cylindrical cage. built up of rope ladders disposed around the periphery of the circular framework. There are in all six of these ladders, anchored top and bottom to iron hoops and with a supporting hoop midway between the end pieces. When extended the cage is about thirteen feet in height by some four feet in diameter. The floor of the cage is built up of rope-netting of fairly close mesh, to afford an easy foothold, while at the top the rope constituting the side members of the ladder are continued to form a cone terminating in an iron ring, by means of which the whole apparatus may be slung from a hook working with a block and tackle. When not in use the whole folds up into a small space, collapsing much after the same manner as a Chinese lantern, so that it can be stowed away in any convenient spot.

If a man falls overboard, or a boat capsizes, a spar carrying a block and tackle is run out over the ship's side and the pulley rope made fast to the top of the cage, which is then thrown toward the scene of the accident. The throwing causes the cage to distend, so that the men in the water grasp a rung of one of the ladders or climb on the outside of the cage, a sufficient length of which is kept above the water. The advantage of the device is that it can be used for saving a number of men, being simply thrown in their midst, when it is easily grasped by all, so that the risk of drowning is minimized. If one of the men cannot swim, the risk of drowning is reduced, as the appliance can easily be hauled toward the helpless by one who is a swimmer, or trained toward the spot by means of the spar tackle to which it is attached. For use in tropical waters. where the seas are infested by marine foes, it is especially useful, since there is sufficient space between the ladders to allow the rescued persons to make their way into the interior of the cage. This done, the cage with its human freight is simply hauled up out of the water by the block and tackle, swung around and safely deposited upon the deck.

The device, it will be seen, is simple both in design and operation. It can be stowed with the hoisting rope attached in any convenient place, ready for instant use. The rope can be attached to the spar block and pulley tackle while the drowning are grasping the appliance, and the device immediately hoisted and swung inboard.

MODERN FIRE FIGHTING APPLIANCES.

By Frank C. Perkins.

SELF-PROPELLED fire engines and auxiliary fire cars, as well as automobile patrol wagons are now employed to advantage by many municipalities. The near future will see electric fire engine pumps in many cities, provision for power being made at various street corners through electric supply connection boxes. A cable from a reel may be easily arranged to supply current to the pump from electric railway or electric light wires.

The automobile fire engine shown in Fig. 1., is equipped with a 60-horse-power engine and has a frame of alloy steel, which is heat treated. This alloy steel is used throughout the car, in order to give a structure of great strength, which is necessary for a heavy vehicle driven at full speed around sharp corners and over rough pavements. This engine, which is in use at Bridgeport, Conn., carries a 50 gallon tank with its various valves, fixtures and hose, the latter being mounted on a reel placed over the tank.

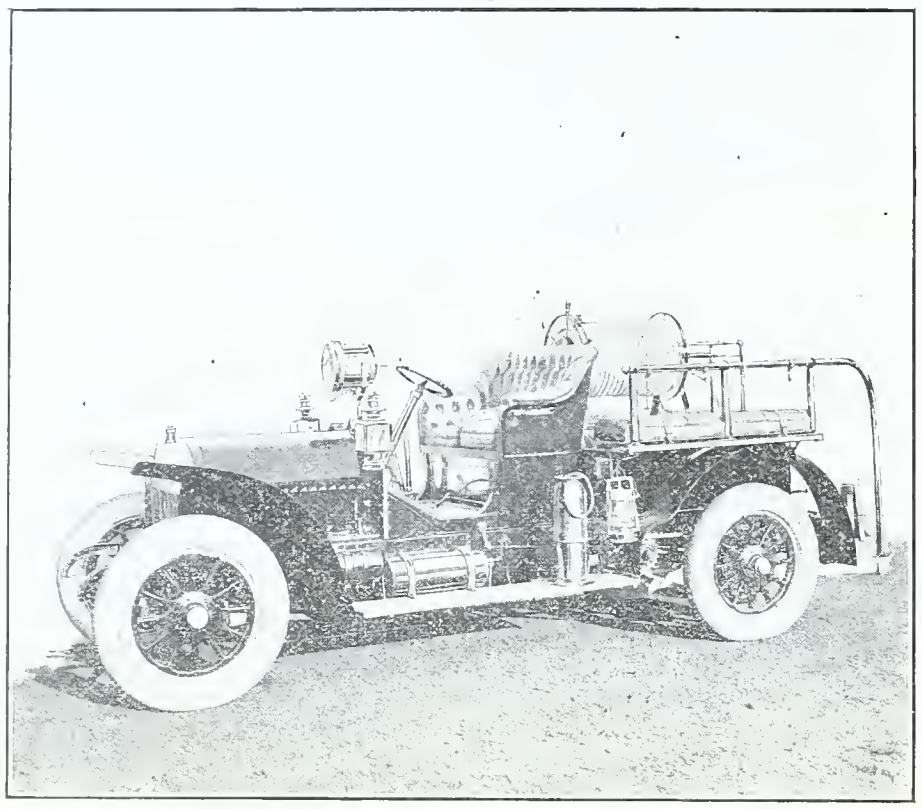


FIG. 1.—BRIDGEPORT AUTOMOBILE HOSE AND CHEMICAL FIRE CAR.

It will be noted that side seats are used in the rear, each of which seat three firemen, while two may stand on the rear step. With the driver and one assistant by his side, this automobile engine has a capacity for eight or ten men. A large Rushmore search-light is used at night, which is started by the driver opening a valve with his foot and switching on the battery with his left hand. The acetylene gas is thus electrically lighted, and immediately the search-light is ready for service.

The engine is of the make-and-break ignition type, a low tension magnet being used. This motor has a bronze engine bed, while the gear box is partly made of manganese bronze, aluminum bronze being used where the heavy stresses occur. The engine has four speeds forward and reverse, the selective system being used.

The auto., of course, carries hand fire extinguishers as well as crowbars, picks, fire axes, helmets, and other similar apparatus. The wheels are 36 inches in diameter, special tire grips being used on the rear ones to prevent skidding. It is maintained that this equipment is a most satisfactory auxiliary to the Bridgeport Fire Department and has given most excellent service.

The automobile police patrol wagon is now being employed to great advantage in many American and European municipalities. The auto-patrol wagon shown in the accompanying illustration (Fig. 2.) is in use at Springfield. Mass., and is provided with an emergency ambulance attachment, which is particularly valuable at large fires.

The Springfield fire department have had in operation for some time an auxiliary fire wagon capable of carrying eight men and an adquate supply of fire fighting implements for subduing an embryo blaze. It is stated that these auto fire cars have been a great success and others are to be employed, as the quickness with which this wagon has been able to reach the conflagrations has made it possible to dispense with twenty men at the outlying districts of the city.



FIG. 2.—SPRINGFIELD AUTO-PATROL WITH AMBULANCE ATTACHMENT.

Handling Postal Cards.

The Government employs a great number and variety of machines in the day's work of its different departments. One of the most novel of mechanical devices is that used by the Postoffice, to count and tie postal cards into bundles. These machines have a capacity for handling, in a day of ten hours, half a million cards, these being counted, wrapped and tied in packages of 25 each, ready for sale. The apparatus consists, roughly speaking, of two long fingers which reach from below and pull the paper off a drum, at stated intervals which permit the passage of 25 cards. Other parts of the machine twine the paper round the package of cards; another finger dips into a reservoir of mucilage and applies itself to the wrapping paper in just the right spot, and a kind of thumb presses the other end of the paper over this spot. whereupon the package is thrown on a carrying belt ready for delivery.

THE SMALL MANUFACTURER vs. THE TRUST.

The following has been received from the Dwyer Machine Company of Lynn, Massachustts.

EDITOR INVENTIVE AGE,

Dear Sir:—We have the May issue of the INVENTIVE AGE and are much pleased with your article on the "Protection of Individual Inventors and Small Manufacturers." The law makers need to be aroused to the needs of the individual inventors and the small manufacturers who are struggling against piratical corporations. The small manufacturer has practically no redress. What our laws offer is so expensive that he can not take advantage of it. Our patent and court system seems designed to work injustice to the small manufacturer and hardship on the community in which he is located. The advantage is on the side of the rich corporation. Every good citizen must admit that the advantage to the stock holder in the rich corporation is trivial compared with our progress as a nation, and the encouragement of individual effort among our inventors and the accruing benefits to those who are given employment.

The government is spending large sums of money to encourage the agriculturist and to supply him with data in regard to fertilizers, machinery, new varieties of products, and even the probable weather. The achievements of the inventor are certainly of great value, yet nothing is done to help him, and he must struggle single-handed against those who would rob him.

Let us give you a specific instance. A young man, college graduate, able and ambitious, selects the manufacture of an electrical specialty as a business. This requires close application and a high degree of technical and business ability. After nine years of industrious effort he has built up a considerable business, employing a hundred hands and distributing many hundreds of dollars each week. He has drawn less from the business for his personal requirements than he pays some of his men. As his factory is located in a town of but a few thousand inhabitants, this money means much to the community.

This company is obliged to spend thousands of dollars to answer before the courts complaints of alleged infringements of patents, and we believe that the suits are brought without proper grounds. The corporation bringing the suits knows that the small company can put up a good defense, but the officials are also aware that the patent which they have obtained possession of gives them the power to make their competitor spend his money. In one case it was doubtful if the process used by the small company was the same as that described by the complainant's patent. In another instance, the process in question was well known to the art more than two years prior to the application for the patent. In a third instance a judgment has just been rendered in these words: "No monopoly of such a process can be spelled out of the patent in suit." This judgment is, of course, in favor of the defendant, but it will not save him annoyance and expense. It is only occasionally that this complaining corporation will allow its cases to come to trial. In many cases they withdraw the suit a few days previously. It is evident that they fear having the patent injured by a judgment against it.

As engineers in touch with many small manufacturers, we are convinced that in nine cases out of ten such suits are brought for malicious reasons, in the hope of putting down competition and not because complainants believe they have just ground.

Several small companies have been sued and put to great expense for the alleged infringement of a patent which, according to foreign law, had already expired and thus been inoperative for two years.

Are the able, industrious men of our country to be discouraged in this fashion? Do not these men represent the best and most honest elements in our social and industrial organization? Are our small communities to lose the earnings which the small factory makes possible? Are we to let foreign countries outstrip us in industrial achievement? The corporation methods may be summed up in the words of Thomas A. Edison "An inventor has no show these days. The moment he invents something which is an epochmaker in the world of commerce or science, there will be pirates springing up on all sides to contest his rights to his ideas."

No matter how self-evident it may be that the small manufacturer is being unjustly sued, he must put up a defense in proper form, which involves considerable expense, or the case will be decided against him by default, injunctions served and damages imposed. He may be obliged to secure evidence as to the state of the art before the patents were granted, (perhaps 18 years ago) which would not be an easy matter, although he knew the process or machine was in common use at the time and that the patentee was not entitled to a patent. He may be obliged to take the testimony of experts as to the dissimilarity of a detail of the machine he is manufacturing, and that described by the patent. After all possible data has been collected, it must be printed and bound in book form before the court will review it. The printing alone for a small case will cost $1000 and often more than this. In this era of typewriters why should this be so? Printing the testimony might have been necessary in the days of longhand, but surely not now.

The patents involved usually belong to that numerous class relating not to clean cut, distinct, important inventions but to trivial details of construction, which require the service of experts to determine if the patent is infringed or if the inventor intended his claims to be interpreted to include a construction so radically different. In many cases it is very doubtful whether there exists any ground for complaint, but it is always up to the small manufacturer to prove he is innocent. The costs of defense, even when he is in no wise culpable, are so excessive that a few suits of this kind will put a small manufacturer down and out, and thus work great hardship on himself and on those who are depending upon him for their livelihood.

Should there not be a government commission to whom the small manufacturer could appeal, and which for the sake of the community in which he lives and the welfare of the country at large would render judgment on these cases at either no expense to the small manufacturer, or at an expense merely nominal. Would it be unreasonable also for the government to grant subsidies to these small inventive manufacturers?

The reason for this is that it is evident, and I believe every small manufacturer in the country as well as many an inventor will bear me out, that these suits are brought simply to stifle competition and often to secure the patent property of the small manufacturer and not because of really equitable reasons.

The Noiseless Gun.

Few recent inventions have received wider attention from the press and the public generally, than the device by which guns can be silenced. Smokeless powder we have long had, and now the noiseless gun is with us, the invention of Hiram P. Maxim, the son of the famous manufacturer. The principle on which the device is based is that of centrifugal force, or the property possessed by rapidly rotating bodies of flying out from the center. When a rifle equipped with one of these silencers is fired, the bullet passes through a cylindrical muffler without the slightest loss in velocity, accuracy or penetration. The powder gases of discharge, however, upon entering the muffler are rotated, or whirled very rapidly, and therefore fly out of the periphery of the silencing chamber. As the only means of exit to the open is near the center of the muffler, the gases are unable to escape until they have slowed down. This slowing down must needs be relatively gradual; therefore the escape is proportionately gradual, and no report follows.

The inventor himself employs the simplest simile in describing the system. The real principle, he says, is just that which prevents water from running out of a set bowl when you pull the stopper after the water has been made to whirl in the vessel. The exploded gases after being made to revolve in the muffler, or silencer, cannot escape suddenly. It is the reverse of the process in a turbine: the device might be called a negative turbine.

The muffler itself is a cylindrical bit of gun metal. For an ordinary sporting rifle it is four inches long, about an inch and an eight in diameter, and weighs but five ounces. It is sufficiently small to be carried in the vest pocket, and it can be adjusted to the gun, by means of a few screw threads, in less than five seconds.

Sportsmen will be quick to realize what a noiseless rifle will mean in hunting; but the trouble is that criminals too will realize the advantages in such a device, as it will enable assassins to get their deadly work in and escape before they can be located. The question has been raised by police captains as to whether this new invention will not prove a serious drawback in detecting crime. It has been suggested that the mufflers should not be made so that they could be adjusted to revolvers or small firearms, and bills have been introduced into State legislatures to cover this point. It is in the navy, however, that the silencer will find its most useful scope of action. Hundreds of our gunners have had their ear drums split while firing big guns on shipboard. The same applies to coast defenses. It is believed that by applying the silencer to the guns in the turrets on our battleships, the gunners could stand by and fire as rapidly as they could reload them, without the slightest inconvenience. There would be no roar or reverberation. People a hundred yards away need not know that anything unusual was happening. In the army, too, the sound of a thousand rifles fired at once would be so slight as to make it possible for orders to be given to a regiment in the regulation way, as at drill. An officer in battle deafened with the cracking of a volley of rifles, realizes that the silencer will prove a boon in more ways than one.

Man Power Dynamo.

A novel dynamo equipment for use with military wireless telegraph outfits is described in *Popular Electricity*. It consists of a small dynamo mounted on a bicycle frame and connected with the sprocket wheel as shown in the illustration. A secure foundation is



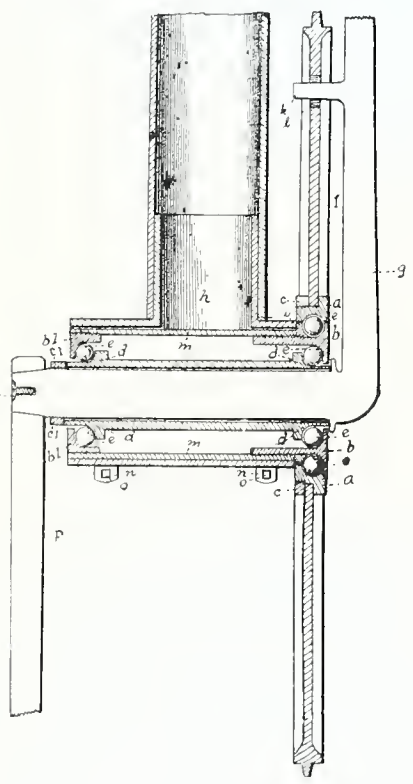
obtained by the use of the pointed caulks on the feet of the frame. As the operator pedals his machine, the heavy flywheel acts as a governor to give the dynamo a fairly uniform speed of rotation. When a message has been sent, it is but the work of a moment to disconnect the dynamo from the wireless outfit and prepare for transportation to another part of the field.

CLEVER NEW PATENTS.

A New Bicycle Sprocket and Crank Shaft. Nail Clencher.—Plowshare Holder. Crate-Side Machine.

A New Bicycle Sprocket and Crank Shaft.

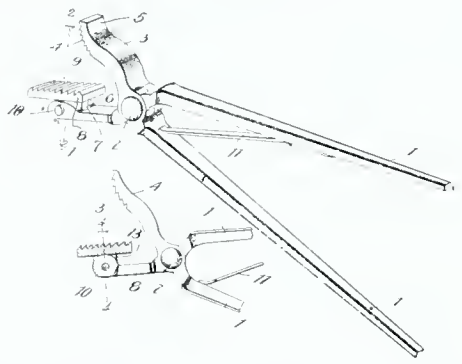
It is a well known fact that in bicycle construction there is a side draft of the crank with respect to the sprocket. This objection, together with the great amount of friction, has been the cause of much annoyance in the general construction. Mr. Arthur L. Girard of Lincoln, Nebr., has finally solved the problem. He has invented a sprocket and crank shaft, which includes separate bearings for the same, said bearings being adapted to eliminate the draft from the sprocket, increase the distance a wheel will run without oiling, and correspondingly decrease the danger of accident due to dry bearings. Referring to the accompanying illustration, it will be seen that the invention comprises an ordinary cone-bearing *d*, constituting an inner bear-



ing for the crank shaft *g*. Arranged around the said bearing *d*, is a second bearing *m*, which is spaced from the first-mentioned bearing, and constitutes a bearing for the sprocket wheel *f*, and is spaced from the said bearing by anti-friction balls. The crank shaft which extends from the first-named bearing is provided with an upstanding arm having a lug *k* adapted to engage the sprocket wheel *f* through the opening *l* located therein. This device renders it impossible to transmit a side pull to the sprocket, and impossible for the shaft to ride on the sprocket wheel or for the sprocket wheel to ride on the shaft, thereby increasing the life of the wheel.

Nail Clencher.

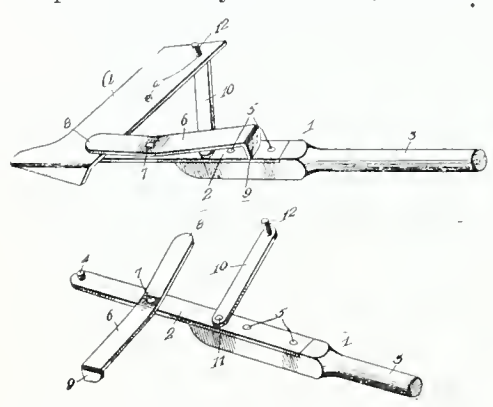
An improved nail clencher is the subject-matter of a patent recently obtained by Patrick Deevy of Melrose, Ia. The invention is a very simple and easily operated device, and is employed for clenching the nails after a horse has been shod. A particular feature of the invention resides in providing one of the pivoted handle members with a clamping plate which is pivoted to said handle member and adapted to engage the shoe. It will seen that the tool comprises a pair of crossed pivoted handles 1-1, one of the handles terminating in an outwardly extending jaw 3, the inner face of the jaw being provided with a series of inwardly inclined clencher teeth 4. The jaw portion of the other handle is formed with a longitudinal extending slot 6 adapted to receive an outwardly projecting lug or ex-



tension 7 produced on the outer face of a flat clamping plate 8, the inner face of said plate being formed with a series of teeth 9 which co-operate with the teeth 4 of the other jaw. A spring 11 has one end secured to one of the arms and the other end bearing against the other arm, and thereby normally hold the jaws in an open position. In the operation of the device, the clamping plate is placed under the shoe and the handle carrying the clencher arm operated to bring the clencher teeth 4 against the nails to be clenched. This done, the device as a whole may be turned slightly to facilitate the clenching operation, with the clamping plate in a stationary position and serving as the pivotal point for the device.

Plowshare Holder.

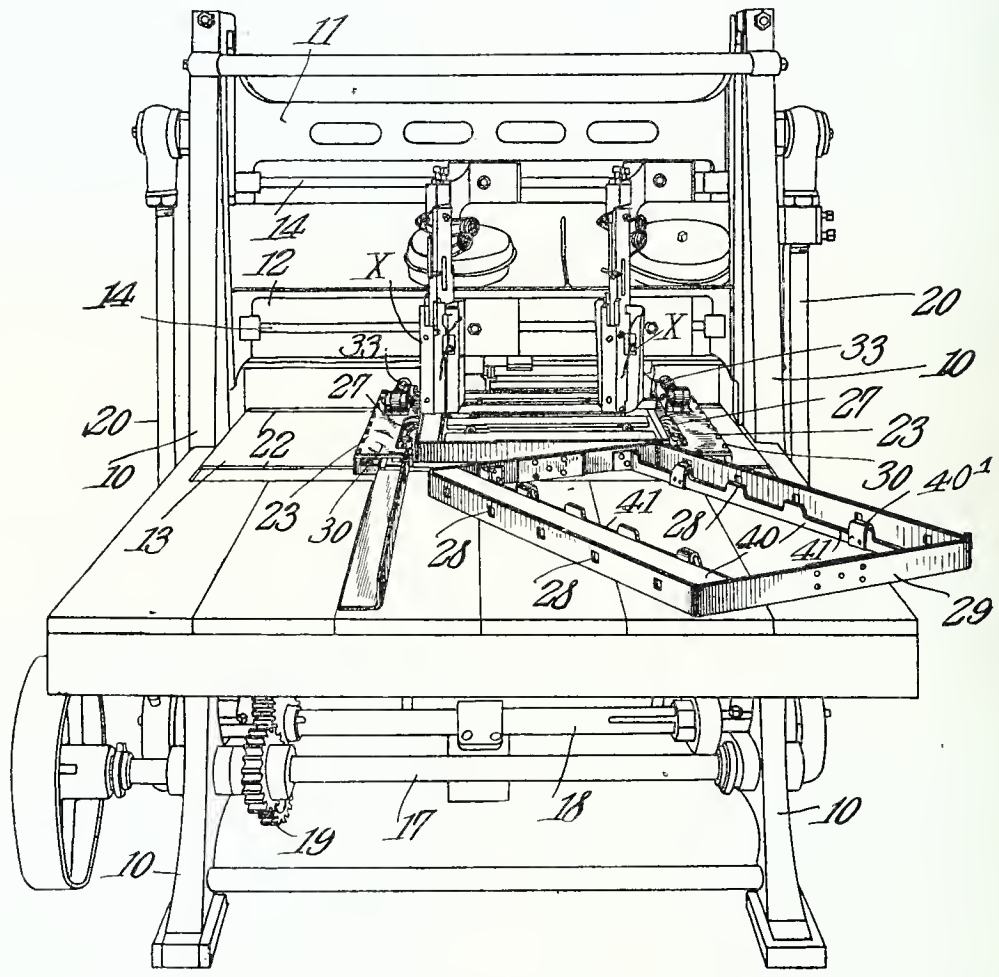
Cecil M. Durnell of Camp Branch, Mo., has recently received letters patent for an improved plowshare holder, which may be easily and quickly engaged with, and disengaged from, a plowshare or the like, and which will permit the same to be effectively held while being sharpened or ground. In the illustration the top figure shows the invention applied to a plowshare, while the lower figure is a perspective view of the holder removed from the plowshare. It will be observed that 1 designates the holder, and *a* the plowshare. The former comprises a body member 2, which is



provided at one end with a handle 3, and at its other end with a stud 4, adapted to enter one of the openings in the plowshare. The stud 4 is adapted to be retained in the said opening by a locking member 6, which is of resilient metal and pivoted at 7 upon the body 2, and having an end 8 adapted to be swung over the plowshare and the stud 4, so as to retain the former upon the latter. In order to prevent the plowshare from swinging around upon the stud 4, a bracing member 10 is provided having a stud 12 to enter one of the openings *a* of the plowshare. The base end of the member 6 is bent at right-angles, and has one of its ends curved to form a cam 9, which engages the body 2 when the end 8 of the locking member is disposed over the stud 4, and thereby firmly retains the plowshare within the holder.

Crate-Side Machine.

Mr. John Eklund, of St. Joseph, Mich., has recently patented a machine employed in the manufacture of crate or box sides, comprising novel means, whereby the longitudinal and cross slats of the sides may be held in properly spaced and crossed relation, and automatically fed to a stapling or other machine, for fastening the slats together. The machine comprises a suitable frame having a pair of standards 10, which are suitably connected by transversely disposed bars 11 and 12, and a platform table 13. This table is adapted to receive a pair of guide bars 23 which may be adjusted independently of each other. A carrying form or frame 29 is also provided having openings 28 formed therein at each side, said openings being adapted to be engaged by pivoted pawls 27 which are mounted on slidable bars 26, the latter sliding in the guide bars 23. In practice, the frame 29 is preferably laid on the table immediately in advance of the table 13 as shown in the illustration, and the longitudinal cross slats are then placed in proper position within the frame, after which the frame is forced ahead until it enters between the two guide



bars 23. The frame is then pushed forward so that the feeding pawls 27 will engage with the first set of openings of the frame 29, and, as the pawls are actuated, they move the frame forward the required distance in which to present the first crossed slat under the stapling or riveting devices *X*. Power is transmitted from suitable gearing 19 under the frame. The pawls automatically disengage from the first set of openings, and are then moved to engage the second set, the operation continuing until the frame is entirely through the machine. It will be noted that after the operator has once engaged the frame with the pawls, the subsequent operation requires no care or attention on his part, and he is thus free to feed in the slats or battens in another frame in readiness for a second operation of the machine, so that the latter may be kept continuously at work.

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LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

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NEW JERSEY PATENT CO. et al. v. SCHAEFFER.

(Circuit Court, E. D. Pennsylvania. Feb. 24, 1908. 159 F. R. p. 171.)

1. PATENTS—INFRINGEMENT—PERSONS LIABLE.

Where an infringement of a patent is brought about by a concert of action between a licensee and others, all engaged directly and intentionally become joint infringers.

2. SAME — RESTRICTIONS ON LICENSES — VALIDITY.

The owner of a patent may fix a minimum price at which his licensees may sell the patented article at retail to the public, and a violation of the license by the licensee is an infringement.

3. SAME — INFRINGEMENT — VIOLATION OF RESTRICTIONS ON SALE OF PATENTED ARTICLE.

Complainant, as exclusive licensee to manufacture and sell a patented article, sold the same only to jobbers under contracts which bound them to sell only at certain prices and only to licensed retail dealers who were required by contract to sell to the public only at certain prices, the license to be forfeited by the breach of such restrictions. Defendant procured another to become a licensee and to purchase the articles and sell the same to him in violation of the license contract, and defendant resold to the public at less than the price fixed by such contract. Held, that such sales were an infringement of the patent.

AMERICAN GRASS TWINE CO. v. CHOATE et al.

(Circuit Court of Appeals, Seventh Circuit. Nov. 15, 1907. 159 F. R. p. 429.)

PATENTS — INFRINGEMENT — MACHINE FOR MAKING GRASS TWINE.

The Lowry patent, No. 524,423, for an automatic feeder for twine making machines, is merely for an adaptation of old elements for use in connection with a machine for making grass twine, and must be limited to the particular form of adaptation shown. Neither such patent nor the Lowry patent, No. 654,991, for a machine for making grass twine, is infringed by the machine of the Monahan and Kieren patent, No. 785,070.

RAINEAR v. WESTERN TUBE CO.

(Circuit Court of Appeals, Third Circuit. Feb. 6, 1908. 159 F. R. p. 431.)

1. PATENTS—INVENTION AND INFRINGEMENT—PIPE COUPLING.

The Hewlett patent, No. 640,197, for a pipe coupling, which consists essentially in the combination in the union coupling of ordinary construction of a brass spud and an iron nut and tailpiece, whereby there is brass to iron at the screw joint and at the sealing joint at the opposing ends of the tailpiece and spud, thereby avoiding the rusting of the joint and securing a closer sealing joint, was not anticipated and discloses invention. Also held infringed.

2. WORDS AND PHRASES—"UNION."

A "union" is a coupling nut, provided at one end with an internal shoulder, adapted to engage a pipe, called a spud, sleeved through the nut and adapted to engage such internal, by its external, shoulder; the other end of the nut being internally threaded and adapted, as it is screwed up, to draw in and seat the beveled end of the spud.

LOCKLIN et al. v. BUCK.

(Circuit Court of Appeals, Second Circuit. Jan. 7, 1908. 159 F. R. p. 434.)

PATENTS-INVENTION-WOVEN WIRE FABRIC.

The Locklin and Fox patent, No. 655,253, for an improvement in woven wire fabrics, which consists of coiled wire springs having the ends flattened to a common plane, and bound by a metallic strip folded longitudinally so as to enclose the ends of the strands and then folded again upon itself, the purpose being to hold the strands in place and to keep the fabric in place under strain, while for a useful improvement, is void for lack of invention in view of the prior art.

HILLARD v. FISHER BOOK TYPEWRITER CO. et al.

(Circuit Court of Appeals, Second Circuit. Jan. 7, 1908. 159 F. R. p. 439.)

1. PATENTS—ANTICIPATION—PRIOR APPLICATION IN PATENT OFFICE.

Statements in a prior application for a patent, relied on as an anticipation of a patent granted while such application was pending, must be so clear and explicit that those skilled in the art will have no difficulty in ascertaining their meaning.

2. SAME — PRIOR PATENT — ACCIDENTAL FUNCTIONS.

Although a new function appears in a machine made under a patent, if it was accidental, unrecognized by the patentee, and no disclosure thereof made to the public, it is not an anticipation of a subsequent patent.

3. SAME—INFRINGEMENT—CHANGE IN FORM AND MANNER OF OPERATION.

Although devices may differ in form, in appearance, and in the manner of operation from those combined in a patent, if they combine to do the same work in substantially the same way, they are an infringement.

4. SAME—TYPEWRITER ESCAPEMENT.

The Hillard patent, No. 580,281 for an improvement in typewriter escapements, was not anticipated, and discloses an invention of more than ordinary merit, which entitles the patentee to a fair range of equivalents; also held infringed by the machine of the Fisher patent, No. 573,868.

YAWMAN & ERBE MFG. CO. v. VETTER DESK WORKS.

(Circuit Court of Appeals, Second Circuit. Jan. 14, 1908. 159 F. R. p. 443.)

PATENTS — INFRINGEMENT — CARD INDEX CLAMP.

The Yawman patent, No. 717,490, for a drawer for card indexes, claims 4, 5, 10, 11, and 12, which relate to a clamping device to hold the card follower in adjusted position, while not for a generic invention, but for a new combination of old elements, covers a device which remedies former defects and supplies a simple, efficient, durable, cheap, and easily manipulated card index clamp, and were not anticipated and disclose invention; also held infringed.

CUTLER-HAMMER MFG. CO. v. AUTOMATIC SWITCH CO. OF BALTIMORE.

(Circuit Court of Appeals, Second Circuit. Jan. 7, 1908. 159 F. R. p. 447.)

PATENTS-INFRINGEMENT-AUTOMATIC ELECTRIC SWITCH.

The Blades patent, No. 453,032, for an automatic electric switch mechanism, in view of the prior art cannot be construed to cover broadly all switch mechanism in which the starter magnet is located on an independent shunt-circuit. As so limited, held not infringed.

CAMERON SEPTIC TANK CO. v. VILLAGE OF SARATOGA SPRINGS et al.

(Circuit Court of Appeals, Second Circuit. Jan. 7, 1908. 159 F. R. p. 453.)

PATENTS—INVENTION-PROCESS AND APPARATUS FOR TREATING SEWAGE.

The Cameron, Commin and Martin patent No. 634,423, for a process of and apparatus for treating sewage as to the process claims, the essential feature of which is the securing of the separate and successive action of the anaerobes and aerobes on the organic matter of the solids in a flowing current of sewage by secluding it before its passage into the aerating tanks in a septic tank, where it is excluded from light, air, and agitation until by the anaerobic action generated therein all organic matter is dissolved and the entire current liquefied, was not anticipated and discloses patentable invention in the discovery and utilization of a process of nature for a practical purpose. The apparatus claims, which cover the construction and arrangement of the series of tanks, disclose nothing broadly new and are void for lack of novelty. The process claims also held infringed.

INTERNATIONAL TIME RECORDING CO. v. W. H. BUNDY RECORDING CO.

(Circuit Court of Appeals, Second Circuit. Feb. 11, 1908. 159 F. R. p. 464.)

PATENTS—VALIDITY AND INFRINGEMENT—WORKMAN'S TIME RECORDER.

The Cooper patent, No. 588,223, for a workman's time recorder, covers only a time recorder in which both the faces of the printing wheels and the position of the abutment on which the card rests are regulated by the clock movements through appropriate mechanical connections. Claim 1 is void as too broad under such construction, and claim 4 as either too broad or, if qualified by the words "substantially as described," so as to make the clock movement of the abutment an element, as a mere duplication of claim 3. Claims 5, 7, and 10 held infringed by a machine in which, while the raising of a cover by hand is necessary to bring the abutment into position, the position proper for that particular day is automatically determined and fixed by the clock mechanism.

SIEBER & TRUSSELL MFG. CO. v. SAUGERTIES MFG. CO.

(Circuit Court, S. D. New York. Feb. 11, 1908. 159 F. R. p. 472.)

PATENTS — INFRINGEMENT — TEMPORARY BINDER.

The Trussell patent, No. 743,114, for a temporary binder for holding loose sheets of paper, is an improvement patent for a combination of old elements in a crowded art, and, in view of the prior art and the limitations imposed by the action of the Patent Office and acquiesced in, is limited substantially to the means shown and described. As so construed, it is not infringed by the device of the Phœnix patent, No. 782,986, which covers a different combination of old elements to accomplish the same result.

WHITTEMORE BROS. & CO. v. WORLD POLISH MFG. CO.

(Circuit Court, M. D. Pennsylvania. Feb. 6, 1908. 159 F. R. p. 480.)

1. PATENTS — SUIT FOR INFRINGEMENT — EFFECT OF PRIOR DECISIONS.

An interlocutory decree adjuding infringement of a patent is not conclusive between the parties in another suit in a different court, and the question must be given independent consideration therein.

2. SAME--INFRINGEMENT—CAN OPENER.

The Cleveland patent, No 727,905, for a can opener, which consists of a lever devioe for attachment to cans or boxes having tight fitting covers to pry off the covers, was not anticipated and discloses patentable invention, but is limited by the prior art to the specific construction described and claimed. As so construed, held not infringed by a device which lacks an offset in the body of the can between that and the cover in which the lever is to lie, which is an element of the third claim; and in which the outside handle does not lie substantially parallel to the surface of the receptacle as required by the other two claims.

DANIEL SLOTE & CO. v. CHARLES A. STRATTON CO.

(Circuit Court, S. D. New York. Feb. 15, 1908. 159 F. R. p. 483.)

PATENTS—INVENTION—BLANK BOOK.

The Bowman patent, No. 468,780, for a blank book, claim 2, in view of the prior art, is void for lack of patentable invention.

KILBOURN KNITTING MACHINE CO. v. LIVERIGHT & DAVIDSON.

(Circuit Court, E. D. Pennsylvania. Feb. 24, 1908. 159 F. R. p. 494.)

PATENTS—SEAMLESS LACE-FRONT STOCKING —NONPATENTABLE ABSTRACTION.

The Blood patent, No. 743,231, claims 3 and 4, being for the mere conception or idea of a machine-knit seamless single-feed stocking, having open or lace-work meshes on the front of the leg and foot, to say nothing of its being merely a putting together of old features, is an abstraction, which is not patentable.

G. & C. MERRIAM CO. v. OGILVIE.

(Circuit Court of Appeals, First Circuit. January 30, 1908. 158 F. R. p. 638.)

1. TRADE-NAMES—NAME OF COPYRIGHTED BOOK — EXPIRATION OF COPYRIGHT—EFFECT.

On the expiration of the copyright on the name "Webster," used in connection with dictionaries, the name became public property; though such name as applied to the dictionary published by the owner of the copyright had acquired a secondary meaning, indicating a particular book published and sold by such owner.

2. SAME.

The right to use a copyrighted name upon the expiration of the copyright becomes public property, subject to the limitation that the right shall be so exercised as not to deceive members of the public and lead them to believe that they are buying the particular thing which was produced under the copyright.

3. SAME—USE OF NAME—ADVERTISING—INJUNCTION.

A publisher, whose copright on the name "Webster" as used in connection with dictionaries has expired, may be enjoined by a competing publisher of dictionaries from issuing circulars to the effect that it has the exclusive right to use the name in such connection.

4. SAME.

The copyright on "Webster's Unabridged Dictionary" having expired, a competing publisher of "Webster's Dictionary" or "Webster's Imperial Dictionary" may be enjoined by the original publisher from issuing misleading and deceptive circulars and advertisements which show an intention to trespass upon the reputation of the original publishers, and deceive purchasers into buying the competing publisher's dictionary, on the supposition that it is one of the series published by the original publisher.

WHITTEMORE BROS. & CO. v. REINHARDT.

(Circuit Court of Appeals, Second Circuit. Feb. 11, 1908. 159 F. R. p. 707.)

PATENTS—INFRINGEMENT—CAN OPENER.

The Cleveland patent, No. 727,905, for a can opener, being a lever device for attachment to cans or boxes having a tight fitting cover to assist in removing such cover, is a narrow one, and the claims cannot be broadened, nor any special latitude be given in applying the doctrine of equivalents. In the first and second claims a handle portion "substantially parallel with the surface of the receptacle" is made an element, and the third contains as an element "an offset in which the part of the lever between the body and the cover of the receptacle may lie," and none of the claims are infringed by a device in which neither of such elements is found.

O'BRIEN v. FOSTER HOSE SUPPORTER COMPANY.

(Circuit Court of Appeals, First Circuit. Dec. 9, 1907. 159 F. R. p. 710.)

PATENTS — ANTICIPATION AND INFRINGEMENT—ABDOMINAL PAD AND HOSE SUPPORTER.

The Young patent, No. 638,540, for a combined abdominal pad and hose supporter, was not anticipated and discloses invention; also held infringed.

DODGE NEEDLE CO. v. JONES.

(Circuit Court of Appeals, Third Circuit. Feb. 7, 1908. 158 F. R. p. 715.)

1. PATENTS—INFRINGEMENT—KNITTING MACHINE NEEDLE.

The Currier patent, No. 743,152, for a knitting machine needle having a latch mounted in a slot on a pivot pin extending transversely through the needle, "the said pivot pin and the side walls of the body adjacent to the ends of the pin being compressed to form depressions, the compressed ends of the pins coinciding with the bottom of the said depressions," relates to an article characterized by its physical features, and not by the method of its construction, and, as limited by the language of its claims and the proceedings in the Patent Office, does not cover a structure having the pin riveted so as to form a head at the ends.

2. SAME — CONSTRUCTION OF CLAIMS — ABANDONMENT.

An applicant for a patent, who, after another applicant has been adjudged priority of invention as to certain of his claims in interference proceedings, canceled such claims, did not acquire any right in the subject-matter thereof by subsequently defeating the issuance of a patent to the other applicant on the ground of prior public use, but the same became abandoned to the public.

MECHANICAL INVENTIONS AND DESIGNS.

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Winfield S. Shelton, Jennings, La. Pump.—One of the objects of this invention is to provide an exceedingly simple structure which will permit the ready removal of the piston without the necessity of dismembering the remaining portions of the pump; and to provide a mechanism that will have a comparatively great capacity without materially increasing the size or bulk of the same as a whole.

Edward Smith Dinkel, Bridgewater, Va. Window Shade Roller. — The present invention is designed to provide ratchet mechanism for window shade rollers, capable of readily engaging and of securely holding a spring actuated roller, and adapted to be readily disengaged from the roller by a downward pull on the window shade. The invention also has for its object to enable the parts of the device to be readily assembled, and to protect the parts and prevent the same from becoming injured or displaced.

Mr. Dinkel has also patented an improved curtain support, which has for its principal object to provide a novel, simple and practicable means that can be readily applied by an unskilled person to the upper sash of a window, and is easily adjusted so that it will properly co-operate with the window frame, regardless of the width and thickness of the same, whereby the curtain will be raised and lowered with the sash in order to admit light and air thereover.

George W. Peterson, Leonardville, Kans. Trunk.—An object of this invention is to equip a trunk with a pair of wheels, and to provide means for projecting the same from the bottom of the trunk at one end thereof to enable the trunk to be quickly and easily wheeled from one point to another. It is also the object of the invention to enable the wheels when not in use to be housed within the trunk, and to prevent dust and other substances from reaching the interior of the trunk through the passage way provided for the wheels and the operating mechanism.

Thomas B. Stephenson, Belle Plaine, Kan. Combined Scriber and Pencil Holder.—An object of this invention is to provide a combined scriber and pencil holder designed for the use of carpenters, and adapted when not in use to be conveniently held inserted under the sweat band of a hat like an ordinary carpenter's pencil. Another object of the invention is to provide a device of this character, adapted to enable small pieces of pencils to be conveniently used and thereby prevent the present great waste of this class of pencils. The invention also has for its object to provide a pencil holder and scriber equipped with a scriber blade, adapted when not in use to be housed within the device.

Frank M. Hitch, inventor; George B. Wyckoff, assignee, Juniata, Neb. Hay Cap.—The object of the present invention is to provide a hay cap, adapted to be readily applied to a hay stack or rick to protect the same from the weather, and capable of effectually preventing the leak which has heretofore occurred where the boards meet at the center of the stack or rick. Another object of the invention is to provide a chain equipped with means for supporting a comb board over the abutting edges of the boards, at the center of the top of the cap, to form a tight joint at that point.

Edward F. Wallace, Oxford, Miss. Prescription Cabinet.—It is the aim of the present invention to provide for the use of druggists and for business men generally a cabinet, adapted to conveniently hold prescriptions, bills and various other papers, and capable of affording ready access to the same and of enabling such prescriptions, bills and the like to be quickly filed. Another object of the invention is to provide a cabinet, which will permit the prescription or bill-holding means when filled to be readily removed from the cabinet.

David B. Whitehill, North Clarendon, Pa. Three patents. The first invention relates more particlularly to mechanism for raising and lowering the bails in oil wells, but can be employed in other relations where hoisting or cable winding mechanism is useful. One of the objects is to provide a simple and novel structure which is entirely effective in raising and lowering the bails, or in fact any other articles or devices, said structure being adapted to be controlled at a distance, thereby permitting the machine to be used in bailing out wells that are scattered over a comparatively large area.

The second invention relates to improvements in drive heads or caps for well pipes or casings, and has for its object to provide a simple and comparatively inexpensive drive head or cap, capable of expansion and contraction to enable it to be properly screwed onto the end of a section of a well pipe or casing, and to be also clamped thereon, whereby it will be effectually prevented from rebounding or otherwise damaging the screw threads.

The third invention relates to a mechanism for circulating water or other cooling medium through the jacket of an explosive engine, and has for its principal object to provide a novel circulating system whereby water may be conveyed through the tank or reservoir to the cylinder of an explosive engine, back to the reservoir or tank, the latter being located so that the water contained therein is in no danger of becoming frozen.

Floyd W. De Tray, Aurora, Ill., inventor; Henry C. Osterman, Frank H. De Tray, and Henry Battisfore, Chicago, Ill., assignees of one-fourth interest each.—This invention relates to improvements in nut-locks, and has for its object to provide a simple, inexpensive and efficient one, of great strength and durability, adapted to be readily applied to an ordinary bolt without necessitating any alteration in the construction thereof, and capable of effectually preventing a nut from accidentally unscrewing when subjected to vibration and rattling incident to its use on rail joints, machinery and the like.

Floyd W. De Tray, Aurora, Ill., inventor; Waldo Dennis, Chicago, Ill., assignee one-half interest.—This invention relates to circuit closures, and more particularly to those employed as telegraph keys, although the features are perhaps useful in other analogous relations. The object of the invention is to provide an instrument with separate means for producing dashes and dots, the latter mechanism being so constructed that dashes cannot be produced thereon, thus materially reducing the chances of mistakes.

Floyd W. De Tray, Aurora, Ill.—This relates to carbureters, and has for its principal object to provide a novel, simple and effective means for producing explosive charges, said means including valve members, which are simultaneously operated, the connections being so arranged that the amount of movement of the one valve can be considerably varied with respect to the amount of movement of the other valve; to provide a novel, simple, and effective means for thoroughly vaporizing the liquid hydrocarbon or other motive fluid prior to its passage to the engine or motor, said means eliminating to a material degree the danger of flooding the carbureter.

Another patent relates to quick-action vises, and more particularly those of the type wherein a rack stem is employed, and has for its object to provide a structure wherein mutilated threads and split nuts are unnecessary, and to so arrange the mechanism that the element which effects the final relative or clamping movement between the jaws also serves as actuating means for effecting the operative movement of the latch or clamping device that secures said element to the movable jaw, and prevents the free sliding movement of the latter.

Charles H. Shultz, St. Joseph, Mo. Three patents.— The first invention relates to frames for holding glass, and is applicable for use as corner posts, mullions, transoms, and the like, whether the bars are located vertically or horizontally. The object of the invention is to provide a simple, novel and strong bar that will effectually hold the glass without injuring the same, and yet will permit of the contraction and expansion thereof, as well as the natural settling of the building, such bar providing a joint that is air, dust, snow and waterproof.

The second invention relates to that class of chutes which are placed in the walls of buildings for directing coal, wood and like material therethrough, and the principal object is to provide a simple structure which can be readily constructed, will constitute an effective chute, and is provided with means that will securely lock the closure in closed position so that it can only be opened from the inside.

The third patent relates to chutes of that type disclosed above, and has for its object to provide a novel locking and actuating means for the closure, said means being readily operable from the inner end of the chute, and being so constructed and arranged that the closure cannot be operated from the outside.

Horace F. Neumeyer, Macungie, Pa. Two patents.—The first invention relates to that class of sprinklers which are intended to be coupled to the end of an ordinary garden hose, and placed upon a lawn for the purpose of watering the same. More particularly, the invention relates to sprinklers, including in their make-up rotary spraying wheels, which are operated by and operated upon streams of water issuing from the bodies of the sprinklers.

The second invention relates to an improved flash-light apparatus, and has for its object to provide such a device which is adapted for use in flash light photography, and capable of producing from magnesium or other suitable material, one or more flashes of light, of short or long duration, dependent on the will of the operator; to provide an apparatus having separable parts, so that, when desired to carry the same in a valise, pocket or the like, it can be packed in a compact form; and also having means for preventing the egress of the magnesium from the magazine when the apparatus is thus packed.

Horace F. and Frank E. Neumeyer, Macungie, Pa. Soap and Brush Holder for Buckets.—The object of the present invention is provide a simple and comparatively inexpensive device, adapted to be readily applied to either a wooden or metallic bucket, and capable of supporting a wet scrubbing brush, so that the drip will fall into the bucket, and of holding the wet soap to avoid placing the same on the floor, wood-work, etc., and thereby prevent the white marks which are left by the soap when the same is placed on such surfaces.

James W. Singmaster, Macungie, Pa., inventor; H. F. Neumeyer, same place, assignee one-half interest.—This invention relates to valve mechanism particularly useful in hydrants, and has for its principle object to provide a mechanism of the above character which will permit a gradually increasing flow of water during the opening movement of the same, thereby avoiding the sudden and objectionable rush of water, said mechanism when in closed position constituting an effective bar to the passage of water, and being provided with a packing valve that is not subjected to the material friction during the opening and closing movements.

James C. Walker, Waco, Texas. Three patents.—The first invention relates to rotary engines operated by motive fluid of practically any character, such as steam, air, gas and the like, and has for its principal object to provide an exceedingly compact structure wherein the steam or other motive fluid is supplied to a plurality of cylinder members directly from a steam chest, and also a simple but effective valve mechanism is provided for controlling the supply of such motive fluid.

The second patent relates to rotary engines of the type above disclosed, and has for its principal object to provide a simple, novel and effective structure, in which a novel abutment mechanism is employed, which will permit the ready passage of the piston during the operation of the engine.

The third invention relates to explosive engines, and the primary object is to provide rotary engine with novel and efficient means for producing an explosive mixture, introducing charges of the same into the engine, and utilizing the exhaust gases in order to avoid waste of power and heat.

Benjamin W. Morgan, Atlanta, Ga., inventor; Simplex Press Company, assignee, Atlanta, Ga. Printing Press. Two patents. — The first invention relates to that class of printing presses having a bed and a cylinder co-acting therewith, and has for its object to provide a novel press wherein the elements and combination of elements are simple, and the necessary cycle of operations is effectively produced and properly maintained.

The second patent relates to printing presses and more particularly to that class employing a reciprocatory bed, and a revoluble cylinder located thereover. The object of this invention is to provide a simple structure in which the successive actions of the various parts are controlled by a single element, and which, in turn, is actuated by the bed; to provide novel means for moving said bed, elevating the cylinder during the retrograde movement thereof, simultaneously actuating the paper gage, and also throwing the fly-frame.

James M. Thomas, Atlanta, Ga., inventor; Simplex Press Company, asssignee. Printing Press.—This invention relates particularly to presses of the type above disclosed, and has for its principal object to provide a novel, simple and effective mechanism for securing the rotation of the cylinder upon the movement of the bed in one direction, and the independent movement of the bed in an opposite direction, together with the elevation of the cylinder from the bed during the latter movement.

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FOR SALE—Patent No. 901,124, dated Oct. 13, 1908. Air agitating device for valve-bearing solutions, or any solution requiring constant agitation. For full particulars address, Thomas A. Ross, Selby, Contra Costa Co., Cal. nov 09

FOR SALE—Patent No. 902,746, dated Nov. 3, 1908. Self-Fastening Hook and Eye. Quickly attached. Looks much like the ordinary hook-and-eye. A certain success. Outright for $2000 or state rights. Address, H. N. Legan, 677 South Pennsylvania St., Denver, Colorado. jy

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FOR SALE—U. S. Patent on a non-refillable bottle, No. 898,575, patented Sept. 15, 1908. For sale at reasonable price, or to let on royalty. Send 10 cents to the publisher of "Inventive Age," (giving this patent number) for a copy of the patent giving full description of same, or write to me for particulars in the matter. Reuben R. Graves. R. F. D. No. 3, Box 35, Salem, Oregon. jy

FOR SALE — Patent No. 906,635. Street-Car-Brake. Works by foot lever. Does away with hard-working crank. Want correspondence with honest men and manufacturers to place brake on the market. Would sell state rights. Address, J. G. Kerr, Ionia, Kansas. jy

FOR SALE — Patent No. 884,599. Improved Stanchion Latch. This is a drop or gravity latch. The best stanchion latch known. Indispensable when once the farmer or dairyman has tried it. Address, D. E. Miles, Box 597, Fredonia, Kansas. jy

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FOR SALE—Patent No. 904,914, dated Nov. 24, 1908. Musical Teething Ring. On royalty basis or outright or both. Rubber goods manufacturers, please notice. A. W. Anderson, Fort Chatham, Seldovia, Alaska. jy

FOR SALE—U. S. Patent No. 902,831, dated Nov. 3, 1908. Self-lubricating bushings for pulleys. Will sell outright. Write C. A. Petersen, P. O. Box 41, Laconia, N. H. jy

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FOR SALE— U. S. Patent No. 913,723, dated March 2, 1909. "The Handy Stanchion." Secures or releases the full row of cattle (or part of row) instantly. A simple, safe, perfect and cheap device. Address, Royal Grafton, Mount Charles, Ont., Canada. aug

FOR SALE—Patent No. 876,264, dated January 7, 1908, Measuring Instrument. A combination level, plumb and inclinometer. Gives the length and bevel of rafters, and intended to be fitted with a telescope and mounted on a tripod for surveying railroad grades, canals, etc. Address, Ira E. Burley, Highwood, Montana. aug

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WANTED.

WANTED—To interest some one in my manure and dirt loader, patented April 20, 1909. Will sell or let on royalty. Price right for immediate disposal. Address, Lars C. Peterson, Route 1, Osage City, Kansas. sep

WANTED—U. S. or foreign patents. Send full description, price etc., in first letter. Address, F. B. Conine, Clifton, Texas. jy

WANTED—We are open to consider anything good in vending machines or real live small novelties. Address, The Automatic Vending Co. Limited, London, Canada. sep

WANTED—A power machine for making wire fence. Any one having same for sale, write me stating particulars. Address, O. A. Crist, Canal Winchester, Ohio. jy

WANTED—A company to buy or manufacture on royalty, patent No. 911,484. Guitar and banjo, both in one. Best instrument on the market. Address, Irvin Fillman, Hastings, Oklahoma. aug

WANTED — Good mechanic wanted to take half interest in Remer rotary engine. Patent No. 610,085. None but mechanics need apply. Address, Frederick W. Remer, 310 D Ave., Lawton, Okla. aug

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Protection of Inventors.

Our comments in the INVENTIVE AGE for May, on the necessity of protecting individual inventors and small manufacturers from the aggression of corporations, have been received with general approval. Several letters endorsing our views have been sent us, one of which appears in full in another column. A correspondent writes from Pennsylvania in the same strain. He says that it is beyond doubt the truth that inventors have no protection against the infringement of their rights under the patent laws—no fighting chance. The lack of money makes it impossible for them to struggle against powerful corporations. He gives it as a probable estimate that 94 per cent of all inventions produced in this country are due to poor men. As a solution of the serious problem, he suggests state associations of inventors, with a national association to meet annually in convention at Washington. "If each state would send delegates to the national convention, all grievances could be brought before a committee on infringements, and each case looked into and decided upon its merits. Often the so-called infringement is but the advance idea of an improvement over the original, and the inventor thinks he has been unjustly dealt with." It has also been suggested that such an organization could promote the sale of patents. Inventions, our correspondent believes, could be more readily disposed of if brought to the attention of those interested through some such medium. Railway officials, for instance, would be more apt to buy a deserving invention if backed by an organization of prestige and influence, especially if the inventor is willing to accept a reasonable price. This is a point which we have already urged in these columns. The inventor should not put an artificial valuation upon his device, and a fair offer should not be refused.

The difficulties which beset the path of the small manufacturer are graphically set forth in a letter which appears elsewhere in this issue. It is only another instance of the constant and consistant pressure brought to bear upon individual enterprises, on the part of the great corporations. The stifling of competition has been carried to such a degree of perfection in the case of many trusts, that all combinations are inspired to similar efforts. A striking evidence of the growing unrest of the public under such exactions, is found in the suggestion which comes from widely different sources, that patent causes be adjusted outside the courts. This desire cannot be ascribed so much to impatience with the law's delay, as to the feeling that the courts can be readily made the unconscious tool of the corporation. This is sometimes due to "influence," but more frequently to the unfair use of legal processes which operate against the small manufacturer. The requirement that all testimony must be printed, at the cost of defendant, is an instance in point. This one item alone in a small case involves an expense of $1,000, and even when he wins he is not reimbursed for such losses.

Preliminary Examinations of the Patent Office.

To those familiar with the procedure of taking out patents, is is hardly necessary to explain that the initial step is to make a search of the records of the Patent Office, in the class to which the invention pertains, to ascertain whether or not the invention is patentable. It might be thought from the circulars and advertisements of some patent attorneys that the report based on such a search is conclusive as to patentability; but, as many know from bitter experience, there is a vast difference between a report of an attorney that an invention is patentable, and the report of the Patent Office on that subject. We need hardly impress upon our readers the fact that certificates or reports as to patentability do not make an invention patentable. In many instances these certificates are based upon imperfect searches, and the certificates furnished are hardly worth the paper they are written on. But no matter how much care or attention is given to a preliminary search in the Patent Office, it can never be conclusive on the question of the patentability of an invention. We cannot too fully impress this upon our readers. In the first place, in making an examination of the records of the Patent Office, the searcher must depend to a large extent upon the classification of inventions of the Office. Take the class of nut and bolt locks, for example. This class is further divided into sixty-six sub-classes, each being distinguished from the others by certain defined characteristics. For instance, one nut lock may engage the threads of the bolt; another may engage the part to which the nut is applied; still another may engage the nut itself. These different types of locks, and many others which it is not necessary to detail, are shown in numerous sub-classes. These are created by the committee on classification of the Patent Office, and as each patent issues on an application for nut-locks, it is put in the sub-class to which it belongs. When a nut-lock is to be examined, the searcher determines in his mind to what particular sub-class it should pertain. He may decide that it is necessary to examine in several of the sub-classes if he is a careful searcher, as patents frequently get misplaced, and are found in one sub-class when they should appear in another. The attorneys and their clerks make their examinations from drawings which are kept in the attorney's room of the Patent Office. The different divisions of the Office have duplicate sets of these drawings, and the examiners in making their examinations of applications, should confine themselves to their own sets of copies of patent. But it is a well known fact that the examiners frequently go to the attorneys' room and search in the classes there, and they have been known to borrow copies and take them away, to be returned later. An attorney may search through that class and this particular copy which has been withdrawn may be the best reference against the invention that is being examined; and because of the fact that the copy of patent is no longer there, the attorney reports the invention patentable. Again, the attorneys have been known to mix up the copies of patent; and it is a fact not disputed that the list of patents from which the attorneys make their examinations, is incomplete. But the most fruitful cause of complaint in the matter of preliminary examinations, is the misplacing of patents and the improper classification. A case of very recent occurrence was when an examination was made in the class of metal bending, on a device that pertained to the shaping of metals, and because no reference was found the invention was reported patentable. The examiner in the Patent Office, however, when he came to investigate the patentability of the invention, found a reference in an entirely different class—a class into which no one would have thought of looking, and which the attorney had no reason to believe had any relation to, or bearing upon, the matter being investigated. If this were an isolated instance, it would not be worth recording, but it is an almost every-day occurrence, and it is because of this fact that attorneys have come to look upon a preliminary examination as nothing more than an indication of the patentability of an invention. If an anticipatory reference is found, of course the question is settled; but if no reference is discovered, a careful attorney does not issue a "certificate" that an invention is patentable—not by any means. All he can say is that he has made a search, and since it has not brought to light any anticipatory patent, he *thinks* the invention patentable.

Not only is the attorney hampered in this way in making a satisfactory preliminary examination, but he is confronted by the fact that the Patent Office examiner may find a foreign patent to cite; or there may be a caveat pending, or an application for patent claiming the same invention; or some manufacturer's catalogue or one of the numerous periodicals on file may show the invention in question. These sources of information are under the control and within the range of search of the primary examiner, and attorneys in their preliminary searches are not permitted to investigate them. Under such circumstances, it appears very much like a lottery to present an application to the Patent Office. In many instances, within the personal knowledge of the editor, cases were thought to be patentable, and the Office decreed otherwise. On the other hand, it must be admitted that inventions are sometimes believed to be doubtful, and the Office does not hesitate to grant a patent. Even such a grant, however, is not accepted as final and conclusive, but as affording merely a *prima facie* presumption. Patents are often declared invalid by the courts, because of the discovery of references which were not brought to light by the Patent Office. Of course the aim of the Office is to make a careful search, but that it fails in many instances is shown by the court records. Possibly when the new committee on classification completes its work, conditions will be better. Certainly there is room for improvement, when the English and German Patent Offices in their actions on applications for patent on the same inventions, find references which the U. S. Patent Office did not discover. We have in mind several instances in which an inventor had obtained a patent in the United States and made application for similar protection abroad, only to have his request rejected by the English or German or Austrian Offices, on account of the citing of various patents which anticipated the invention and which the U. S. Patent Office should have found.

Can Attorneys be Trusted?

There is no idea more prevalent among inventors than that there are attorneys practicing before the Patent Office who cannot be trusted, and are likely to appropriate their inventions. From an experience extending over many years, we think there is greater possibility of an attorney appropriating to his own use the money sent by an inventor, than the invention itself. Indeed, the chances of the latter are so slight as to be practically negligible. Yet, so pronounced is this impression that we have known of cases where inventors have travelled all the way from the Pacific Coast to Washington, merely for the purpose of making a personal search in the records of the Patent Office to ascertain if their devices were patentable. They were not willing to trust the attorney with any knowledge of the invention until they had examined the Office to find out if the records were clear. There is very little foundation for this suspicion of attorneys on the part of inventors, for we do not recall a single instance where a device has been stolen by an attorney to whom the secret had been entrusted. Inventors have often been imposed upon by incompetent attorneys, but the question of competency figures less in the mind of the inventor than that of honesty. A man may be honest and yet incompetent,

or he may be competent and dishonest, though one is less likely to find the latter than the former. The competent attorney is, as a rule, an honest one. If an inventor would make a greater effort to inquire as to his attorney's competency, he would stand a better chance of securing a good patent in the end. One way of doing this is is to secure references and write to several of them. Another way is to get from the attorney copies of patents obtained by him in the particular class in which the inventor is interested, with the view of determining just what grade of work may be expected. Too much care cannot be exercised in the selection of an attorney. It is next in importance to the invention itself, for a careless preparation of the papers, or an indifferent prosecution of the application, may result in a worthless patent. No matter how good a device may be, if the patent does not protect it, its value is vastly depreciated. An inventor ought to start out with the idea that the main point for him to consider in the selection of an attorney is the latter's competency to handle the particular application that is to be given him. The Patent Office will protect an inventor against an attorney's dishonesty, but there is no protection, either from the Patent Office or from any other source, against incompetency. The Patent Office realizes that fully, and in its rules of practice it cautions applicants to exercise care in the choosing of attorneys. And yet few applicants follow this advice. They see advertisements in the paper and without investigating the attorney's references, proceed to employ him, when if a close examination had been made, his incompetency would have developed. An attorney may be competent to prosecute an application for patent on a nut lock, and yet be incompetent to handle a case relating to the art of electricity, or one pertaining to looms or mills. Indeed, there are now attorneys who make a specialty in electrical or chemical lines, and the inventor of a chemical combination or an electrical apparatus should select an agent who can show his ability to handle an application in those classes. We would again emphasize that it is the competency of an attorney that should be considered, as the Patent Office will take care that he is honest.

To Regulate Furnace Dampers.

There are few duties that the average man regards with less enthusiasm than the necessity of crawling out of bed of an early winter morning, and descending to the cellar to fix the furnace. It is surprising that the ingenious American mind did not long ago evolve some means of avoiding this unpleasant obligation. The solution of the difficulty now offered is none the less welcome. A base board fitted with two screw eyes, through which the usual damper chains pass, is put in a convenient position. Hinged to the board is a U-shaped lever, with one arm five inches long, and the other long enough to hold the two ends of the chains. The lever is far enough away from the screw eyes to allow the opening and closing of the drafts. The screw eyes are placed one on either side of the short arm of the lever. An alarm clock, equipped with a winding key that turns when the alarm goes off, is supported on a hook near by. A piece of cord connects the key and the long arm of the lever, and is wound around the key, and the chains are hung in place on the short arm. The clock is set, and when the alarm goes off, the cord unwinds, and the dampers open. The alarm can of course be set at any time in the morning desired, and so long as the time is regular, this little servant will be punctual in its labor.

Typewriter Carriage Reverser.

One of the early attachments for the typewriter was a device to enable the operator to return the carriage to the beginning of a new line, without removing the hands from the keyboard. It was abandoned probably because nobody thought it could be done otherwise than manually—and a good idea went astray. Now comes an expert typist from Pennsylvania, with a simple electrical attachment which makes the carriage of the machine return instantly and silently to the writing point at the beginning of the new line, without jar, shock or rebound. Moreover, explains the *Inland Stationer*, it automatically spaces the platen or cylinder at the same time. In operation, the person writing merely touches a key, and the carriage glides smoothly back to the right, the cylinder at the same time turning over one line, so that the operator has nothing to do with the shifting of the carriage or platen. The device may be attached to any of the machines now in general use, the operation being extremely simple and occupying only a few minutes' time. Current from the ordinary incandescent electric light socket furnishes the power, which is trifling, and does not interfere in any way with the lighting arrangements at the stenographer's desk. The apparatus was exhibited at the National Business Show in New York last fall, and won general commendation.

Industrial Uses of Acetylene.

Acetylene makes the most ideal light known for use in railroad construction and emergency night work. It possesses the advantage of incomparable simplicity, in comparison with other lights, having no pumps, gages, valves or moving parts, and requiring no attention during use. The mere weight of a column of water performs all the work formerly done by a man, who had to frequently pump air and oil into his tank.

The acetylene light for this work merely requires the cock to be turned on and the match applied to the burner, says the *Engineering Digest*. Any of the oil lights heretofore used needed to have the burner heated and the oil vaporized before they could start work. This in wet or cold weather, might be a difficult operation, and a storm would immediately extinguish the light. With acetylene and the burner protected by a parabolic reflector, the flame defies wind and water—in fact water may be thrown over a high pressure flame in bucketsful without any other effect than to enhance its value by cooling the burner. With a burner consuming ten cubic feet of gas per hour, an illuminant will be produced of sufficient power to supply a large gang of men working in an excavation. The cost of operating this class of light is lower than that of oil. The portability of acetylene is one of its strong features. It is lighter than oil lamps of the same capacity, and can be more easily transported. In mines, tunnels and sewers, the use of acetylene is cheaper than the installing of an electric system. The flame is smokeless, and the gas burns more readily in bad air than any other open flame, and still consumes less air to vitiate the atmosphere. The utility of acetylene marine lights is well recognized. They are largely used on railways and steamships, for emergency work. It is predicted that in the future, acetylene may be used for powerful heating, as well as lighting, or for other industrial purposes than welding, and perhaps, mixed with another suitable element, in place of liquid fuel.

New Methods of Slaughtering Animals.

Much interest has been expressed of late in methods in use in slaughter houses, the desire being to cause the general adoption of humane processes of killing animals for food. The most up-to-date system employed in any country is probably that common in parts of France, where they electrocute oxen, sheep, etc. Experiments have shown that animals can be electrocuted easily and without pain. A professor of Nantes discovered this method during the course of researches made with a view of causing electric sleep. The apparatus necessary is simple and inexpensive, and the electric current need not be stronger than that employed for lighting purposes of low voltage. The animal, when subjected to this current, lapses into perfect insensibility, the functions of circulation, respiration, etc. being stopped. If the current is turned off before two minutes have elapsed, life is restored again, and the animal seems as well as ever; but if the current is continued for a longer period, it dies from asphyxia.

In Germany, according to our consuls there, a kind of ejector pistol is frequently employed. The barrel contains a special kind of conical-shaped bolt, through the core of which a hole is drilled, terminating in two small openings at the sides of the pointed ends. The cartridge is inserted in the breech, which is closed by lateral pressure. The device is placed against the animal's forehead, and, the trigger being pulled, the bolt pierces the skull. Not only the mechanical action of the bolt but the irruption of gas and the great pressure it exerts on the brain produce immediate insensibility. Cartridges are used in some instances, but the bolt is considered better, as this apparatus prevents the uncontrolled flight of the projectile and makes it impossible for bystanders to be injured. After the cattle have fallen, a wire is inserted through the hole in the skull to the depth of two feet, to sever the nerve connection.

To Count the Cost of Labor.

The past decade has witnessed important advances in many lines, but possibly none has shown more rapid evolution than the science of cost accounting. It is an easy matter to reckon the costs of the material employed in an industry; but to determine the expense of labor involves much more complex accounting. An instrument which has been highly successful in serving to facilitate the counting of the cost of labor is the calculagraph, a description of which appears in a recent issue of the *Engineering Digest*. The apparatus in appearance resembles a round box, with a dial on the top and two handles projecting upward, one on either side. Record cards are provided, on which are printed the several operations performed in the manufacturing plant where the machine is to be used, with a vacant space to receive the calculagraph record. When a workman begins a task, one of these cards is inserted in a slot in the apparatus, under the platen in front of the dial, and it is shoved along against a guide from left to right until it fits in a corner. The right hand lever is then operated, which indicates the time work was commenced. An arrow in the center of the dial represents the minute hand of a clock face and a triangular-shaped pointer, which rotates around the outside of the dial, and represents the hour hand of a clock. This record, which shows the hour at which work begins, is made by moving the right-hand lever backward. The forward movement of the same lever prints two circles of figures on the card. At the end of the working period, the card is returned to the machine, and the left-hand lever is operated. This causes two arrows to be printed in the centers of the two circles of figures just mentioned, at the left end of the card. One of these circles is for hours and the other for minutes; read together they indicate the period of time that has elapsed since the work was begun.

A large number of such records of working time may be printed on separate cards, and each one will appear on its card accurately without reference to others that may have been begun or finished during the interval. It will thus appear that one calculagraph is capable of printing the time employed of every workman on every operation performed, without any liability of inaccuracies on the part of clerks in substracting written records of time, or errors of workmen in incorrectly entering the time they use on a specific task.

Concrete Bleachers.

Devotees of the national game will be interested in the fact that the old wooden seats provided for the rooters and fans are to be done away with. Wood is becoming such a scarce article that it is found cheaper to abandon this time-honored construction, and to substitute the material used in sky-scrapers—a combination of steel and concrete. Not a square foot of wood is used in these latest forms of bleachers, which are being adopted at Philadelphia and other baseball grounds.

A CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE. This keeps inventors and manufacturers posted in the art in which they are most interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy; twenty copies $1.50.—Please give correct data in ordering.—Address,

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Garment-hanger....A. Wilkin
Garter-clasp....J. S. Blinn
Gas-burner....J. J. Moore
Gas cut-off....A. E. Westburg
Gas-engine....C. E. Mead
Gas-furnace, Regenerative....J. B. Acker
Gas generator and lamp....R. L. Doran
Gas, Making producer....E. E. Slick
Gate-fastener....D. H. Kilroy
Gear, Transmission....W. R. Dunkel
Glass-cutting machine....R. L. Frink
Glass, Grinding plate....L. Spachtholz et al
Golf practice-net....J. R. Bolton
Grain-cooler....H. Hager
Grain-drier....W. E. Ellis
Grinding cylindrical surfaces, Apparatus for...J. L. Bogert
Grinding-machine....W. J. Bastian et al
Gun, Breech-loading....A. H. Fox et al
Gun-cleaning device....H. Tupes et al
Hair-drying apparatus....W. A. Soles
Hair-tonic....T. M. Bartlett
Hame, Adjustable....G. P., C. E., and A. A. Peterson
Hame-fastening....G. A. Long
Hammer, Numbering....F. Pröll
Hammock attachment....I. E. Palmer
Hand-strap....R. L. Douglass
Handle-bar bracket, Adjustable..S. E. Purdum
Harness....A. A. Chaney
Harrow....N. C. Hale
Harvester....H. J. Holly
Harvesters, Gearing for cotton-..R. C. Scherling
Harvester and husking machine, Corn....F. W. Wellensiek
Hat-guard....O. A. Danielson
Hat-pin....T. M. Fraehlich
Hay-press....W. M. Pickard
Heating and hot-water system, Combination...J. A. Flynn
Heating and ventilating system, Combined....M. F. Weidenbach et al
Heating system, Hot-air....R. G. Speer
Heating system, Steam....F. E. Siebenmann
Heel-protecting plate, Embedded....S. Tolcs
Hemp-brake....H. C. Anderson
Hermetically closing vessels, Composition for use in....C. Jovignot
Hinge....F. Keil
Hinge, Detachable....W. S. Eschbach
Hoisting apparatus....C. A. Dixon
Hook....C. Saunders
Horse-cleaner....W. F. Mylchreest
Horse-cover....J. Blair
Hose-coupling....W. E. Crook
Hose-shield....G. E. Burtscher
Hot-water heater....J. Mracek
House-leveling instrument....F. Sheppard
Hub-band....J. A. Slater
Hub, Vehicle-wheel....T. L. McConnaughey
Humidifier....A. R. Clarkson
Hydrocarbons into gas or vapor, Method of and apparatus for converting liquid....E. B. Benham
Induction-motor....T. Abtmeyer
Ingots, Press for the manufacture of hollow...H. Harmet
Inhaler....H. Weir
Insect-powder sprayer....E. Ludde
Instruments, Case or support for fragile....H. Y. Norwood
Instruments, Indicating means for....H. P. Davis et al
Internal-combustion engine....C. W. Weiss
Internal-combustion engine..J. C. Peache et al
Invalid-table....J. Scheibner
Inventory, Perpetual....E. C. Albree
Ironing-machine....W. R. Hager
Ironing-machine....Y. Kawakami
Ironing-machine....B. A. Metcalf
Jacquard connection....W. R. Scott
Jewelry-fastener....N. Lieberfreund
Jockey-stick....J. A. Lillie
Justifying mechanism....B. F. Bellows
Kennel....J. S. Minion
Kinetoscope, Continuous-film...C. B. Gillespie
Knife-switch....J. H. Miller
Ladder, Scaffold....J. R. Jones
Lamp-extinguisher....R. Jr., and J. F. Stokes
Lamp socket, Incandescent-electric-. D. E. Bown
Lamps and the like, Pressure-regulator for....M. F. McCarthy
Lamps, Ceiling-rosette for drop electric....W. Wilbraham
Lamps, Cluster-fixture for electric....P. H. Jahnig
Lamps, Masks for automobile-...H. D. Penney
Lantern, Cold-blast....K. L. Stendahl
Latch....F. Keil
Lavatory....J. S. Rowe
Lavatory....H. M. Weaver
Leach-casting machine....J. J. Stehling
Leaf-turner....J. F. Young
Leather for boots and shoes, Machine for cutting out upper....A. Bates
Leather with fabric, Coating....F. J. Gleason
Legging, Folding storm....T. D. Miller
Lemon-juice extractor....W. F. Easley
Life-raft....C Ritson
Lifting-jack....F. L. Gormley et al
Lifting-jack....F. L. Gormley
Line-chalker....A. M. Starr
Linotype-making mechanism....B. F. Bellows
Loading apparatus....J. E. Agler
Lock....L. A. Wise
Lock....M. Goldstein
Lock and signal and lighting switch, Combined....W. R. Schlage
Locking device, Key....W. Finn
Loom-shuttle....S. A. Dudley
Lubricating-cup for steam-chests, &c....T. Carrick
Lubricating system....H. N. Link
Mail-bag catcher....S. C. Hovey
Mail-bag catcher and deliverer. J. V. Thompson
Mail-bag catcher and delivering apparatus....O. and L. W. Channell
Mail-bag receiving and delivering apparatus..C. C. Gardner
Mail-bags from trains and the like, Device for delivering and receiving....S. Jaross
Mail delivering and collecting system, Rural-..F. E. Been
Manure-spreader....D. K. Wilson et al
Manure-spreader....O. J. Grundy
Match-box holder....L. Paden
Match-delivery apparatus....W. H. Morris
Matrix-distributing mechanism..B. F. Bellows
Matrix-drying press....M. S. Bentley
Mattress, Wire....C. J. Witzel
Measurer, Liquid....C. C. Allen
Measuring apparatus, Liquid-....H. Pein
Measuring instruments, Magnet-support for electrical....J. H. Zimmermann
Measuring the weight and other qualities of a material....G. C. Chaney
Meat-tenderer....J. O. King et al
Mechanical movement....D. O. Makean
Mechanical movement....A. Sears
Metal-working rolls....W. J. Williams
Metals from ores, Separating....P. Germain
Metals immersed in liquids, Preventing corrosion of....P. E. G. Cumberland
Metals, Separation of....R. D. Divine
Metals therefrom, Treatment of pyrites liquor for winning....J. H. Thwaites
Metallic tie....F. A. Humme
Milk, Drying....J. R. Hatmaker
Moistener, Broom....W. A. Fuller
Molds with molding material, Loading....C. W. Carter
Mop-wringer....J. J. Davis
Motor controller, Electric....H. W. Cheney
Motor-starter, Automatic. C. T. Henderson et al
Motors, Self-starter for electric...C. H. Miller
Mowing-machine clover-bunching attachment..S. C. Storer et al
Mowing-machine....T. E. Ewer
Music-leaf turner....B. Wahl et al
Music-leaf turner....F. Horrell
Musical instrument, Automatic...W. F. Bayer
Musical instrument, Stringed....G. T. Lewis
Musical instrument, Stringed. S. W. Buercklin
Musical instruments, Duplex tracker-board for automatic....M. Clark
Musical instruments or players, Duplex tracker-board for automatic....M. Clark
Musical instruments, Picker for stringed....E. J. Scarlett
Note-sheet-cutting apparatus....W. R. Crippen
Nozzle for humidifiers, Spray-...S. W. Cramer
Numbering-machine, Typographic....B. B. Conrad et al
Nut, Grip....A. Y. Davis
Nut-lock....L. L. Roberts
Nut-lock....J. Perrie
Nut-locking mechanism....C. N. Gilmore
Nut wrench, Axle....J. W. Hall
Oil-can....A. R. Clark
Oiler, Car....G. G. Crane
Orchestrions and similar musical instruments, Barrel for....P. Lochmann
Ore-concentrator, 2 pats....E. Deister
Ore-separator....J. T. Donovan, Sr.
Ore-separator....O. Medaris
Ores, Reducing....F. J. Tone
Organs or similar musical instruments, Key and key-action for....C. S. Haskell
Ornamental glass....G. H. Brabrook
Osteopathic table....J. V. McManus et al
Outlet-box for electric conduits. W. A. Bonnell
Overshoe....E. P. Rickert
Ozone-producer....S. M. Kintner
Package-wiring machine....S. Wheeler
Packaging-machine....M. L. Keyes
Pants-presser....J. B. Hanna
Paper and producing same, Foiled....G. F. Mansbridge
Paper box....H. Zell
Paper-clip....V. Munger
Paper, Shaping abrasive....G. S. Tenney
Paper trimmer, Block wall-....J. W. Moore
Passenger-register for public vehicles....H. E. Pim
Pasting-machine....L. V. Estes
Peach slitting and pitting machine....S. J. Dunkley
Pen....J. A. Alling
Pen, Stylographic....E. de la Rue
Photomicrographic apparatus....R. L. Watkins et al
Piano, Self-playing....E. C. Hiscock
Piano tuning-pin....J. F. Conover
Picture-film magazine....T. A. Nolan
Picture-films, Fireproof magazine for....T. A. Nolan
Pictures and other articles, Attachment applicable for supporting....A. Siddall
Pin....C. Dean et al
Pin....G. W. Dover (Reissue)
Pincushion, Perfumed....G. J. Lewis
Pipe-clamp for ground-contacts....T. Nagel
Pipe-closure....J. D. Blake
Pipe-coupling....H. E. Keyes
Pipe-coupling....A. T. Herrick
Pipe-fitting....D. T. Williams
Pipe fitting, Hot-water heating-....M. C. Honeywell
Pipe-threader, Ratchet....M. Dixon
Pipe-wrench....O. W. Blake
Piston-ring....H. Harkins
Pitman connection....W. L. Chrysler et al
Planer for narrow work, Wood-....C. W. H. Blood
Planter....W. Frede
Planters, Adjustable wheel for corn-....J. A. Mussetter
Plate-holder....H. B. Rouse
Platform, Dumping-....S. A. Morehouse
Pliers, End-cutting....G. E. Burtscher
Plow....C. L. Avery
Plow-landside....J. C. and J. A. Fischer
Plow, Rotary....W. F. Brown
Plow structure....W. L. Paul
Plug, Detachable....P. R. Yuzuk
Poisoning product, Animal-. F. Bolduan et al
Polishing and cleaning machine...M. Forsberg
Post-brace....H. J. Fritz
Post-cards, &c., Dispensing-machine for....W. D. Evans et al
Potato-digger....J. Moreau
Potato-digger attachment....W. Cooper
Power-transmission mechanism....J. E. Fries
Press....H. W. Shepard
Press-roll mechanism....J. L. Graham
Printing-machine inking mechanism....E. M. Lockwood
Printing or embossing plates, Making....J. Hartnett, Jr.
Printing-plate-making machine....J. S. Duncan
Printing-press....F. W. Geissenhainer et al
Printing-press chase....E. Karl
Printing-press feeder....A. Krause
Propeller, Screw....G. Mackaness
Pump....A. T. Kasley
Pump and drill rods, Grab for....E. P. Law
Pump and spray-tank, Combined force-....R. S. Sheldon
Pump, Centrifugal....A. N. Parnall
Pump, Compression....F. G. Perez
Pump, Pneumatic suction-....D. T. Williams
Pump, Rotary mercury vacuum-...W. Gaede
Pumping apparatus, Portable pneumatic....J. W. Smith
Punch, Spiral....H. C. Roberts
Punching or shearing machine....C. A. Bertsch et al
Pyrometers and the like, Indicating and recording apparatus for....W. Armour
Radiator, Jacket....W. R. Kloeb
Rail clamp, Guard....J. B. Strong
Rail connection....W. H. Yerkes
Rail-joint....R. Harrison
Rail-joint....A. Ambert
Rail system, Guard....A. Morrison
Rail system, Third....Y. Burgess

Railway-fastening.....C. H. Cornell
Railway-rail.....J. C. Flynn
Railway-rail-joint bolt-holder.....C. Rahmgren
Railway-rails from spreading, Device to prevent.....W. H. Walters
Railway-rails to metallic ties, Device for securing.....J. Phelan
Railway-switch, Automatic.....J. W. Sparks
Railway system, Electric.....R. Stearns
Railway-tie.....W. W. Hicks
Railway-tie.....J. A. Byers
Railway-tie.....N. H. Conger
Railway-tie, Metallic, 2 pats....J. G. Snyder
Range-finder.....A. A. Michelson
Raspberry-cleaner.....M. B. Sherman
Ratchet-wrench.....J. O. Shelburne
Receptacle.....A. B. Starr et al
Record-holder.....A. M. Seeley
Resilient wheel.....J. and C. Reuse
Rifle, Magazine-.....J. J. Catron
Road-crossing.....L. Frederick
Roasting-furnace.....F. E. Marcy
Rod coupling, Sectional-.....R. H. Villard
Roll-polisher.....T. Lombardi
Rolling tie-plate bars.....W. J. Williams
Rope-clamp.....F. J. Hampel
Rotary engine.....W. S. Minor
Rotary engine.....O. Staff
Rotary steam-engine.....P. C. Burhans
Rotor construction.....B. A. Behrend
Rubber waste of all kinds, Regenerating.....J. H. L. Neilson
Sales and cash register.....W. H. Stepanek
Sanitary trap.....F. Richardson
Sash-weight-molding apparatus.....B. H. Cooper et al
Saw.....G. A. Zimmermann
Saw-handle.....E. T. Kirkpatrick
Saw-set.....W. W. Oberg
Scale.....W. R. Mittendorf
Scale beam and poise.....J. A. Fleming
Scales, Balance-ball for.....M. Ruckes
Scourer, Cutlery-.....M. C. Clark
Scraper, Mechanical.....F. R. Abeel
Screen and clothes-rack, Combined.....M. L. Ramey
Screw-threads, Device for cutting crooked.....A. S. Baird
Seat-register.....W. and S. Barr
Self-fitting key.....H. J. Hjorth
Self-lubricating wheel.....J. F. King
Sewed articles, Seam for.....J. P. Weis
Sewing and cutting machines, Throat-plate for buttonhole.....D. Noble et al
Sewing-machine.....J. P. Weis
Sewing machine, Leather-.....G. J. Martin
Shade and curtain bracket, Adjustable.....R. D. Lewis
Shaft, Wagon-.....C. Erickson
Sheet-metal container.H. A. Keiner (Reissue)
Shock-loading apparatus.....S. C. English
Shoe.....J. G. Miller
Shoe-cleaner.....L. R. Van Kirk
Shoe for athletes.....G. L. Pierce
Shoe-lining-cementing machine.....O. J. Lear
Shoe-stretcher.....C. L. Passmore
Shoe-tree, Hygienic.....R. F. Van Heusen
Shuttle-check.....R. D. Hunt et al
Signal apparatus, Electric.....C. E. Duffie
Signaling apparatus, Submarine.E. C. Wood
Signaling apparatus, Submarine.....E. C. Wood et al
Signaling system, 2 pats....H. G. Webster
Signaling system, Selective.....A. W. Jones
Silo construction.....O. Brumbaugh
Silo-door fastener.....K. Kleven
Skate, Roller-.....M. B. Grout
Slate-picker.....C. S. Farrer
Smelting-furnace, Electric.....C. E. Wilson
Smoke-consuming furnace.....G. Crysler
Snap-switch.....J. H. Wyatt
Sodium sulfate and sulfuric acid, Making.....O. Zahn
Sole stamping and slitting machine.....G. E. Ward
Soles, Arch-shank for shoe-.....T. F. and C. E. Eaton
Sound-reproducing apparatus.....O. G. Rose
Sound transmitter and receiver..A. J. Mundy
Speed-changing mechanism..F. C. Brunhouse
Speed mechanism, Variable-.J. A. Goodner et al
Spindle.....C. S. and J. H. Foster
Spinning-ring and adjustable holder therefor, Rotary.....J. A. Walton
Spraying and coating machine, Compressed-air.....R. M. Johnston
Square, Rustic.....F. A. Virtue
Squib-igniter.....J. A. Wranischar
Stacker, Pneumatic straw-..S. M. O. Bangen
Staging, Adjustable.....J. E. Miller
Stalk-cutter, Double-row.....F. M. Peden
Stamp-cushion.....F. E. Frost
Stamp-sticker and envelop-sealer.....J. T. F. Baeyertz
Station-indicator.....T. Tanner
Steam-controller, Vacuum....F. A. Simonds
Steam-engine.....J. A. and M. W. Hill
Steam-generator.....H. L. Van Zile et al
Steam-generator for motor-cars.....H. A. Turnbull et al
Steel pipe with a double-armored-concrete coating.....A. J. Bonna
Stock tying and releasing device, Live-.....G. Dani
Store-front construction.....E. S. Rhoads
Stove-deflector.....E. Stombaugh
Stove, Heating-.....W. H. Jones et al
Strainer for milk-cans.....H. Edner
Straw of flax or other plants, Chemical process for the treatment of the.....A. M. D. de Ballore
Studs, Automatic machine for manufacturing lower parts of press-.....A. Prym
Swing-support.....T. A. McPherson et al
Switch.....O. J. Wyler et al
Switch-operating mechanism.....H. C. Kinsel
Switch-stand safety-lock.....R. F. Jacob
Switch-thrower, Automatic.....C. E. Moody
Switch-throwing device.....D. D. Arehart, Jr.
Syringe.....B. F. Lockwood
Tapping machine, Main-...W. H. Van Winkle
Tea, coffee, grain or other substances, Apparatus for drying.....S. C. Davidson
Teapots and other vessels, Hinge for lids of..G. W. Knapp
Telautograph.....A. M. and K. Knudsen
Telegraphy, Mast for space or wireless.....A. E. Brown
Telephone.....A. G. Kaufman et al
Telephone-exchange system.....H. G. Webster
Telephone-exchanges, Means for counting conversations at.....J. H. Meyer
Telephone-switchboards, Self-restoring clear-out drop for.....C. D. Enochs
Telephone system, 2 pats.....H. G. Webster
Telephone-transmitter.....H. F. Albright
Telephone-transmitters, Concentrating device for.....O. F. Falk
Thermostat.....J. H. Swan
Thread knotting apparatus, Pile-.....E. Paruszewski
Tie-plate.....M. Bartley
Tie-plate and rail-joint support, Anticreeping..L. R. Zollinger
Tie plate, Rail-.....W. J. Williams
Tile, Composite-.....J. A. Wheeler
Tile-machine.....W. W. Myers et al
Time-indicating system.....A. A. Radtke
Tire, Automobile-.....H. Parsons
Tire, Pneumatic.....W. H. Snyder
Tire, Pneumatic.....G. L. Kline
Tires, &c. Chuck for boring and turning locomotive-.....G. L. Bennett
Tires, Puncture-proof attachment for.....J. B. Oatman
Tobacco-pipe.....W. E. Elam
Tool, Combination-.....P. E. Shortt
Tool-holder.....G. T. Reiss
Tool-holding appliance.....E. J. Belknap
Tov.....R. E. Peteet
Toy, Mechanical.....C. W. Clark
Toy, Wheel.....H. T. Kingsbury
Transfer mechanism.....V. Ross
Transmitting apparatus, 2 pats.H. Shoemaker
Transom-operating device.....G. Dickie
Tree prop, Fruit-.....B. Fisher
Trolley.....C. W. Smith
Trolley.....P. Coval et al
Trolley-harp.....F. A. Tribbe
Trolley-head.....J. E. Robbins et al
Trolley-head and trolley.....G. H. Merwin
Trolley, Overhead.....J. C. Sturgeon
Trolley switch, Overhead-.....E. C. Folsom
Trousers presser and stretcher.....B. S. O'Brien et al
Truck, Car-.....E. Prouty
Truck, Car-.....J. Timms
Truck, Tonguc-.....C. A. A. Rand
Turbine.....J. A. Groshon
Turbine.....C. E. Etnier
Turbine.....H. Lentz
Type, Printing-.....S. H. Perky
Type-writer.....F. J. Müller
Type-writer adding attachment..H. H. Burton
Type-writer of the type-bar class.....H. Moya
Type-writing machine, 2 pats.....J. Felbel
Type-writing machine.....H. H. Steele
Type-writing machine, 2 pats.....J. C. Doane
Type-writing machine, 2 pats...U. G. Fuller
Type-writing machine, 2 pats.H. S. McCormack
Umbrella-handle and receptacle, Combined.....J. Stern
Urinal, Wall-.....D. A. Ebinger
Utensil-handle.....D. C. Howard
Vacuum-pan for evaporating apparatus.....G. R. Ray
Valve.....T. W. Demarest
Valve.....P. E. Goehle, Sr.
Valve, Automatic spring-controlled lift-.....A. Beck
Valve, Flush-.....W. W. Smith
Valve for flush-tanks, Water-inlet.....E. Morris et al
Valve for liquid-weighing machines, Regulating-.....H. W. Meyer
Valve for locomotives, By-pass...J. G. Blunt
Valve-gear.....L. King
Valve-gear.....H. Lentz et al
Valve mechanism.....H. E. Perrault
Valve mechanism for channeling-machines.....H. V. Haight
Valve, Safety-.....F. A. Casey
Valve, Tank-.....F. Lohman
Vanilla-beans, Extracting essences and tinctures from.....E. M. Howell
Vault, Burial-.....E. D. Millhouse
Vault-head.....A. W. Kurz
Vehicle, Convertible.....C. H. Stratton
Vehicle-spring.....E. F. Brown
Vehicle-spring shock-absorber..M. D. Shilling
Vehicle-wheel.....G. R. Williams
Vehicles, Sled-runner attachment for wheeled.....E. M. Henle
Vending-machine.....W. Asbury
Vending-machine.....A. E. Dieterich
Vending-machine, Coin-operated.....H. Pein
Veneering-press.....K. F. Hummel
Vessel, Double-walled.....E. Fleischauer
Vessels, Shelter for use in connection with submarine.....M. A. Laubeuf
Vest, Protective.....G. H. Blaker et al
Vise, Quick-adjustment.....R. M. Smith
Voltage-regulator.....F. Darlington
Voltage-regulator.....S. D. Sprong et al
Voltage-regulators, Movable terminal for.....F. Darlington
Wall construction.....F. Koch
Warp-spacing device.....J. G. Gourdeau
Warping-machine.....N. A. Hover
Washing appliance, Clothes-.....F. Nowak
Washing-machine.....F. M. Mitchell
Washing-machine.....R. Rainalter
Washing-machine clothes-holder.....L. W. Mammen
Water, acid, and alkali proof articles, Manufacture of.....I. L. Roberts
Water-closet.....N. Frost
Water-closet and apparatus for flushing same..W. Wilson et al
Water-glass guard and lamp, Combinations..C. A. Pratte et al
Water-heater.....F. C. Damm
Water-heater.....H. W. Carter
Water-jacket.....C. W. Hawkes
Water-power machine.....T. J. Vanderslice
Water-tube boiler.....P. Trainor
Waterproof articles from fibrous materials, Manufacturing of.....I. L. Roberts
Waterproof material.....J. Glassford
Weather-strip.....J. L. Porter
Weed-folder.....C. F. Moore
Weighing apparatus, Automatic...C. D. Scott
Well-screen.....W. A. Archer
Wheel.....H. E. Keyes
Wheel-machines, Indexing device for..C. Borg
Whiffletree-hook.....T. Morcom
Window-screen construction....J. G. Hudspith
Wire-coil-making.....J. F. Marsolais
Wire-support.....T. P. Chandler
Wire-working machine.....G. B. Smith
Work-support.....J. H. Lesh
Worms, Apparatus for cutting globoid.....A. T. Collier
Wrench.....E. Hagerstrand
Wrench.....A. C. Allen
Wrench.....W. H. Dawson

DESIGNS.

Cane.....A. H. Sager et al
Glass vessel.....A. Steffin
Lamp.....C. Hendrickson
Lamp-shade.....H. D. McFaddin

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MECHANICAL PATENTS.

Abrading-machine.....O. W. Brenizer
Acid, Alkyl esters of methylene citric.....R. Berendes
Acid from gas mixtures containing oxids of nitrogen, Obtaining nitric.....L. Glaser
Acid, Recovering hydrocyanic.....W. Feld
Addressing or mailing machine.....C. Owens
Adjustable bracket.....T. Smith
Aerating-machine.....H. Pearce
Air-brake system.....E. J. Newton
Air for purposes of ventilation, Apparatus for distributing compressed....H. Arndt et al
Air-ship.....B. H. Tingley
Air-ship.....M. H. Whalen
Ammonia, Making.....C. Krauss
Amusement device.....C. F. Peck
Anchor.....M. W. Hall
Animal-exterminator, Electric.....B. S. Ames
Anvil.....W. E. Andrews
Aralkyl-para-aminophenol.....P. Rehländer
Armor or deck plates, Treating...S. S. Wales
Assembling apparatus.....N. Marshall
Atomizer.....C. E. Michael
Automatic switch.....C. H. Bierman
Automatic switch.....W. E. Dewein et al
Automobile headlight-adjuster.....L. M. Leach
Automobile vehicle.....L. H. Dyer
Automobile-wheel.....O. A. Hamre
Automobiles, Auxiliary starting device for....J. W. and F. Jackson
Automobiles, Rear axle for.....F. C. Miller
Automobiles, &c., Spring for.....C. A. Lieb
Babbitting device.....J. M. Maynard
Baking-form.....E. Schmidt
Balance-wheels, Apparatus for adjusting.....F. R. Cunningham
Ball-plays, Device for.....B. Jirotka
Ballistic plate.....S. S. Wales
Banding or winding machine.....C. Boderck
Barrel-fastener.....G. R. King
Barrel-support.....H. K. Loskamp
Barrette.....C. H. Howe
Basket, Desk-.....U. K. Hall
Bath-tub foothold.....J. H. Pugh
Bath-tub rims, Handhold for.....J. H. Pugh
Battery box or tray and handle therefor.....J. N. Davis
Bearing, Roller-.....H. W. Alden
Bearing, Roller-.....F. M. Freeburg
Bearing, Roller-.....S. Kaye
Bearings, Lathe attachment for turning.....C. Philipp
Bed side rail.....W. B. Munn
Blanks, Making ornamental.....G. U. Meyer
Bleaching apparatus.....W. B. Lewis
Blower for peas or the like...A. H. Wheeler
Boat for shallow waters.....A. C. Larr
Boat-rowing machine.....C. H. Clifton
Boat, Submarine.....L. Y. Spear
Boat, Submarine or submersible...C. Laurenti
Boilers of the locomotive type, Superheater for.....W. Schmidt
Book-covers, Making flexible.....J. McKibbin
Book-mark.....A. Eberle
Boring-bar.....D. H. Shattuck
Boring-bars, Expansion cutter-head for.....C. M. Buck
Boring-machine.....R. Winkler
Bottle and jar closure.....O. Becher
Bottle, Antirefillable.....J. Rivière
Bottle casing, Vacuum-.....P. O. E. Friedrich
Bottle-closure.....F. C. Stöckel
Bottle, Non-refillable.....J. C. Davis
Bottle-sealing cap.....L. Kalling
Bottle, Vacuum-.....J. G. Lyman
Bottle, Vacuum-insulated, 2 pats.....G. P. Van Wye
Bottle, Vacuum nursing-....P. O. E. Friedrich
Bottles and like vessels, Closure for.....P. Leinbrock
Bottles containing aerated liquids, Stopper for.....D. Landau
Bowl, Sugar-.....J. T. McLellan
Box corner-stay and reinforce....H. C. Tufts
Box-lid fastener.....G. C. Frazier
Bracket.....R. W. Hubbard
Brick and the like and producing the same, Composition of matter for use in fire-.....L. House
Brick-glazing compound.....H. and J. Ohlsen
Broom-holder.....A. Marko
Brush, Rotary.....W. F. Wegner
Bucket, Clam-shell.....J. W. Frazier et al
Buggy-curtain.....G. W. Atkins
Buildings and apparatus therefor, Constructing.....A. and E. W. Foster
Burner.....J. N. Leach
Cabinet, Dispensing grocery-....R. F. Ballard
Cabinet, Filing-.....A. Gaul, Jr.
Calcination, Process of.....J. C. Heckman
Calendar, Perpetual.....S. M. Stroock et al
Camera focusing attachment....W. F. Folmer
Can-feeding apparatus.....E. M. Burr
Can-filler.....E. E. Schultz
Can-heads or other sheet-metal blanks, Cutting.....F. Rudolphi
Can-opener.....W. T. Favorite
Car attachment, Street-.....J. N. Nixon
Car-coupling.....M. C. Ironside
Car door, Grain-.....N. Hoople
Car-door lock.....C. H. Lewis
Car-fender.....H. M. Lambert
Car-fender.....I. B. Crane
Car fender or guard.....F. F. Hayes
Car fender or guard, Railway-.G. A. Parmenter
Car, Freight-.....H. W. Kirchner
Car, Mine-.....J. M. Hansen
Car, Passenger-.....F. Koch
Car, Passenger-.....S. M. Curwen
Car, Passenger-.....H. Howson
Car-platform arrangement, Street.P. N. Jones
Car, Revolving matte-.....J. C. Kilker
Car-seat backs, Ajustable seat-back support for reversible.....K. L. Mangan
Car, Transfer-.....C. E. Dinkey
Car-wheel.....S. H. Lanyon
Car-window cinder-guard, Railway-.....C. W. Kennon
Carbureter.....A. Howarth
Cards, Playing.....F. D. Windell
Casks and other vessels, Means for venting..L. E. Saunders
Caster, Adjustable.....C. Bopp
Cattle-guard.....J. A. Lee
Cell for electrolytic or other purposes.....H. S. Blackmore
Cellulose acetates, Manufacture of objects from.....A. Schloss
Centrifugal drier.....O. Keefer
Centrifugal separator.....B. A. O. Prollius
Centrifugal separators, Liner for.....B. A. O. Prollius
Chain, Cutter-.....R. E. Noble
Chain-clasp.....H. E. Kerley
Chair.....J. Smith
Cheese-cutter.....J. Purcell
Cheese-cutter.....L. J. Kunick
Chimney-cleaner.....G. S. Stuart
Churn.....L. C. Lewis
Churn.....M. W. Beemer
Cigar-retainer and inner seal..A. H. Andrews
Clamp.....J. Rivers
Cleaning apparatus, Pneumatic.....C. W. E. Boegel et al
Clock-gong.....W. C. Morgan
Closet-fitting.....W. M. Weatherly
Clothes-line.....J. M. Peterman
Coal and the like, Apparatus for trimming and elevating.....R. Brown
Coal from vehicles, Device for unloading and delivering.....G. E. Chalfant
Coal-gasifying furnace.....H. Ries
Coat and hat hook.....R. W. Hubbard
Coating with tin or allied metals, Electrically.....J. C. Beneker
Coke-oven.....C. Schroeter
Collar, Coat-.....M. Koppelman
Combination-bench.....H. S. Maynard
Compressor.....F. A. Rider
Compressors, Controlling device for two-stage..R. Conrader
Concrete blocks for buildings, Machine for making.....W. G. Bailey
Concrete-reinforcing means...E. G. du Mazuel
Continuous press.....S. J. Vernsten
Controller-regulator.....C. E. Lord
Convertible table and settee.....B. Katzenberg
Cord-holder.....V. H. Rooks
Corn-drying rack.....G. Wenzelmann
Corner-shield.....J. H. Jennison
Cotton-chopper and row-cleaner, Combined...W. R. Pruitt
Coupling.....E. H. Gold
Coupling-head.....J. S. Sheafe
Couplings, Safety-check for automatic.....S. T. Shroyer
Cover, Metallic.....O. R. Fowler
Covers to vessels, Means for securing.....A. T. Lieb
Crane.....I. A. Suess
Crate.....G. J. Mulzer
Crate, Folding.....P. J. Baker
Culinary vessel.....J. H. Ressler
Cultivator.....J. A. King
Cultivator.....E. M. Heylman
Current motor, Alternating-.....W. E. Goldsborough
Current variations, Producing amplified.....E. Weintaub et al
Currycomb attachment.....R. W. Hamler
Curtain-pole.....R. Deucher
Curtain-pole.....J. M. Wiedeman
Curtain-pole ring.....F. Bartholomae
Cut-off, Automatic.....V. A. Croshier
Dams, dikes, &c., and in simultaneously compressing portions of ground adjacent thereto, Providing water-tight vertical layers in....A. Sprauss
Dispensing-can, Non-refillable.....S. Strauss
Display apparatus, Sample-...H. O. Johnson
Display-rack.....J. Danziger
Display-receptacle.....E. W. Carnes
Distilling gases and vapors, Retort for.....P. A. Emanuel
Distribution system.....J. L. Hall et al
Domestic boiler.....J. Woods
Door attachment.....B. J. Auffart
Door-bolt, Multiple.....W. J. Parle
Door bumper and holder.....J. A. Poché
Door check and buffer.....J. C. Peterman
Door-fastener.....E. L. Smith et al
Door-retaining device.....J. Whitaker
Door, Sliding.....E. R. Jackson
Dough-mixing machine.....C. Chambers, Jr.
Drier.....E. L. Wallace et al
Drilling-machine.....R. M. Downie
Drop-lights, Adjustable support for.P. Frantz
Dye and making same, Anthracene..M. Isler
Ecraseur or casting instrument.....J. Sklar
Electric connector, Separable.F. C. De Reamer
Electric-current regulator.....T. Spencer
Electric cut-out.....W. B. Potter
Electric devices, Multiple operation of vapor..R. E. Russell
Electric-distribution system.....E. F. W. Alexanderson
Electric-light key-socket.....W. C. Clark
Electric-lighting system.....C. Feldmann
Electric machine, Commutator-type high-speed dynamo-.....C. J. Yates
Electric machine, Dynamo-.A. H. Timmerman
Electric machine, Dynamo-.....J. D. Firmin
Electric machine, Dynamo-.....B. A. Behrend
Electric machines, Brush-rigging for dynamo-..G. Dunn
Electrical signal.....P. I. Chandeysson
Electric switch.....W. V. Steiger
Electric switch, Push-button.....J. G. Peterson
Electric switches, Movable contact for.....J. G. Peterson
Electrical devices, Wire attachment for.....H. Trumbull
Electrical-distribution system.....M. O. Troy
Electrical ground connections, Irrigating device for.....B. J. Jones
Electrical switch.....I. G. Waterman
Elevator.....F. J. Feldt
Elevator control device, Automatic.L. J. Milke
Embroidery-machine.....C. Georges

Embossing die, Interchangeable letter-.....M. Ginsburg
Engine bed for dories, Portable gasolene-.....M. D. Thompson
Engine-starter.....D. C. Wilgus
Engine starting device, Gasolene-.....J. L. White et al
Engine timing gear mechanism, Explosive-.....L. D. Hubbell
Engines, Controlling the exhaust from internal-combustion.....T. B. Doolittle
Engineering instrument....R. V. R. Reynolds
Engraving-machine, Pantograph, 3 pats.....J. T. Rawsthorne et al
Envelop-fastener.....J. S. Applegate
Excavating device.....W. C. Weeks
Excavator.....R. P. McCormick
Explosives by percussion-caps, Apparatus for firing.....L. H. Broadwater
Eyeglass-spring.....G. W. Wells
Fan for mines, Ventilating-.....W. D. Scott
Feed-water heater.....R. L. Vosburgh
Feeding mechanism.....W. E. Swanger et al
Fence-post.....J. D. Rodgers
Ferro-nickel and nickel-steel, Making.....F. R. Carpenter
Fertilizer-distributer.....J. Boda
File, Paper-.....W. E. Davies
Filing register, Document-.....A. Weizenbäck
Filter.....C. R. Perry et al
Filter-beds, &c., Apparatus for discharging liquids from and to.....C. R. B. Brown
Filter-crib.....S. Diescher
Fire-alarm.....A. T. Newman
Fire-alarm system, Automatic.....F. Bain
Fire-escape.....P. O'Thayne
Fire-extinguisher tanks, Construction of.....G. F. Fifer
Firearms, Single trigger for double-barreled.....A. A. Stutzman
Fireplace.....T. J. Harper
Fireproof partition, Reinforced...J. Comerma
First-aid package.....J. E. Lee
Flask.....J. L. Butler
Floor-conduit and detachable cover therefor.....C. W. Wachtel, Jr.
Floor waxer and polisher.....K. Kariya
Flue-cutter.....J. T. Fuhrmann
Flying-machine.....C. R. Culver
Folding table.....L. Nolan
Force-feed lubricator..C. B. and F. W. Hodges
Forging-press.....A. Christianson
Foundations for compressible, submerged, or moist ground, System of.....F. J. M. M. Ducastel
Foundry-flask.....E. P. Power
Fruit-cutter.....M. G. Troxell
Furnace-door operator.....C. A. Anderson
Furnaces, Means for running off slag from blast-.....J. Marsden et al
Furniture, Combination.....N. J. Cote
Fuse.....L. and J. Schulman
Gage-wheel and colter, Combined.....H. H. Dreyer
Garment-hanger.....W. C. Morris
Garment-supporter.....C. P. Meyer
Gas-analyzing apparatus...H. N. Cheney et al
Gas apparatus, Water-.....L. D. Carroll
Gas burnuer, Alchol-.....W. E. Cochran
Gas-burner fastening means.....C. T. Fuller
Gas-burner heater attachment.....G. Yoerger
Gas-burner, Incandescent.....W. S. Stapley
Gas-burner, Safety.....B. Martelli
Gas cut-off, Automatic.....L. and H. Schmidt
Gas from liquid hydracarbons, Apparatus for producing.....J. M. Willard
Gas generator, Acetylene-.....W. W. Cozins
Gas-igniter, Electric.....W. D. Brackett
Gasolene-engine.....G. H. Marquardt
Gear, Compensating.....E. J. Gould
Gear, Self-locking drive-.....F. Hendler
Gear, Variable-speed and reversible.....G. P. Innes et al
Gearing.....F. J. Zecher
Gearing, Transmission-...J. M. Van Dyke et al
Glass-beveling machine.....F. Cotterell
Glass-blowing machine...H. A. Schnelbach et al
Glass-cutting machine.....J. E. Grayhill
Glass, Teeming.....F. L. O. Wadsworth
Glass-tuhe-cutting machine.....J. E. Graybill
Glass-working apparatus.....A. E. Spinasse
Glassware, Mold for machines for making hollow.....J. Wolf
Glazier's instrument.....J. W. Tucker
Glove, Cotton-picking.....N. J. Baggett
Golf-club.....J. Youds
Governor, Marine-engine.....I. D. Kissack
Graduating-machine.....A. Geiger
Grain-door and car-door, Combined.....J. S. Bender
Grain-immersing machine.....S. T. Helgeson
Grain-screen.....H. E. Wack
Grain-shocking implement.....R. J. Groves
Grain-tank, Metal.....C. M. Porter
Grass-catcher.....J. H. Coult
Grass destroyer, Quack-.....C. C. Nelson
Grinding-machine.....A. B. Landis
Grindstones, Huh construction for.G. Sanfason
Guard.....D. D. Ogilvie
Gun, Automatic.....C. D. Lovelace
Guns, Electrical transmitting apparatus for controlling the sighting of, 2 pats.....A. T. Dawson et al
Hair-tonic.....E. T. Waterman et al
Hammock-suspension device....W. J. McBride
Harmonica attachment.....R. J. Fraser
Harness line-support.....O. Heidingsfeld et al
Harvester, Beet-.....J. T. Carroll
Hat-brim-curling machine.....C. E. Sackett
Hat-fastener.....W. Haraden
Hat-guard.....P. M. M. Louhrie
Hat-holder.....E. C. Dailey
Hay gatherer and loader.....E. Lovelady
Hay-press.....A. F. W. Diamond
Heating, Low-pressure.....E. H. Gold
Heel-cushion for shoes.....L. E. Cummings
Hinge, Door-.....C. Keith et al
Hoe.....E. Senn
Hog-ringer.....W. F. Barnhardt
Hoisting apparatus.....E. N. Drew
Holder or support.....F. F. Hespe et al
Holding device.....H. T. Epperson
Hook.....A. K. Lovell
Hoop-fastener.....W. Mosher et al
Horn, Sound-augmenting.....A. R. Cunnius
Horse-releaser.....J. J. Harper
Horseshoe.....J. H. Fawkes
Hose-coupling.....C. L. Friday
Hot-water boiler.....J. E. Peck
Hot-water heater.....T. J. Shearman
Hub-boring machine.....S. A. Taylor
Huh, Wheel-.....W. C. Thede
Hydrocarbon-burner.....T. Muehleisen
Hydrocarbon-engine.....J. Brons
Ice-cream freezer.....A. G. Hoefler et al
Ice-tongs.....G. P. Yeakle
Ignition-timers, Safety-adjuster for.....B. N. Davis
Indexing mechanism.....B. M. W. Hanson
Indicator.....A. V. Ballin
Ingot-mold.....E. Gathmann
Ingot-stripper.....B. W. Head
Insulator.....L. McCarthy
Internal-combustion engine...B. M. Aslakson
Ironing machine, Collar-.....J. T. Snelson
Jam, sugar or the like on or in biscuits and like confections, Apparatus for depositing or dropping.....R. McVitie et al
Jar-closure.....J. E. Barranger
Jar-holder.....J. L. Dahlquist
Jewelry.....H. Tropin
Joist-hanger.....J. Tuteur
Journal-hearing, Antifriction.....O. C. Knipe
Journal-hox.....P. A. Campbell
Journal-boxes, Waste-suuporting attachment for.....R. A. Billingham
Keg, Powder-.....M. C. O'Laughlin
Kettle-cover.....C. J. Schmidt
Key-socket switch.....H. Hubbell
Keyboard, Practice-.....A. J. Daniel
Kinetographic apparatus.....C. A. Lumière
Knapsack.....R. S. Royce
Knitting-machines, Latch-opening decvice for.....H. Swinglehurst
Knoh attachment, Door-.....B. Revoir
Knoh compensator, Door-.....W. S. Trask
Lace machine, Twist-.....C. Hickton
Ladder, Extension-.....G. G. Crabh
Ladder, Step-.....E. C. Mead
Lamp.....H. F. Smith
Lamp, Arc-.....B. Monasch
Lamp for automobiles, Automatic swivel-.....J. O. Spang
Lamp-holder.....H. L. Erlandsson
Lamp-socket, Weatherproof.H. T. Hochhausen
Lamp socket, Incandescent-...A. L. Williams
Lamp switching device, Electric-...C. A. Eimer
Lamp-testing machine, Incandescent-.....T. W. Frech, Jr.
Lamps, Locking device for miners'.....O. M. Müller
Latch.....O. Lewis
Latch.....C. A. Milligan
Lathe.....C. F. Davis et al
Lathe tool-rest.....W. C. MacBain
Lathe, Turret-.....B. M. W. Hanson
Lathes, Mechanism for shifting the cross-slides of.....B. M. W. Hanson
Lead matrix.....H. Schimansky
Leather-working machine.....F. K. Russell
Lettering or stamping frame.....H. Engan
Lifting-jack.....G. F. Freed
Lineman's combination-tool.....R. H. Brown
Liquid purifier and separator.H. E. Deckebach
Liquids, Apparatus for determining the depth of.....J. W. Jones
Loader.....V. Landholm
Lock.....T. B. Jeffery
Lock.....H. P. Townsend
Lock for drawers of cabinets, &c.....E. G. Sampson
Locomotive, Articulated.....G. W. Henry, Jr.
Locomotive sanding apparatus...S. H. Dunning
Locomotive-superheater.....S. M. Vauclain
Loom.....F. Travella
Loom, Automatic weft-replenishing.M. L. Stone
Loom shedding mechanism..A. and S. Widmer
Looms, Pile-cutting device for carpet-.....F. Farmer
Lubricator.....A. A. Webster
Machinery lubricator, Steam-..G. W. Edwards
Magnet, Polarized.....E. A. Burlingame
Mail-bag catcher.....J. S. Shepherd
Mail-hox.....W. H. Johnson
Mail-box, Letter and package.....C. Ohlson
Map-case.....A. S. Smith
Mask for removing and preventing wrinkles, Facial.....E. Hannig
Massage apparatus, Vibratory...H. C. Brown
Mast.....H. B. De Groot
Match-hox.....A. L. Evrett et al
Match-hox, Self-igniting folded...P. E. Gonon
Match-machine.....W. H. Parker
Mattress-filling device.....J. F. Dettman et al
Measuring apparatus.....G. W. Chamherlain
Measuring-gage.....A. A. Kent
Measuring instrument..H. L. Van Valkenburg
Measuring, mixing and dispensing apparatus, Liquid.....J. P. Muth
Meat-salter.....F. Hackmann et al
Mechanical movement.....W. L. Gass et al
Mechanical movement.....P. T. McNally
Metal disks, Device for straightening.....O. G. Rieske
Metal-forming machine.....J. Uhri
Metal-reducing machine.....B. M. W. Hanson
Metal-shearing machine.F. W. Mathiessen, Jr.
Metal-working machines, Tail-stock for.....B. M. W. Hanson
Milk, Treating.....J. L. Goucher
Mill.....J. L. Terwilliger
Mining-buckets, &c., Automatic catch for.....T. C. Wright
Mixer.....T. H. Hood
Mixer and vaporizer.....G. W. Wright
Mixing-machine.....R. Edmondson
Molder's snap-flask.....H. G. Voight
Money-box.....J. Nutry
Monkey-wrench.....J. Mason
Mortising-machine.....G. W. Campbell
Motor-control system.....H. E. White
Motor-starter, Automatic.....W. F. Hendry
Mower.....H. Norman
Mowers, Fender-rod for.....J. Dain
Napkin-holder.....H. H. Frick
Necktie.....J. T. Cowen
Nut-lock.....J. C. Crowson
Nut-lock.....F. A. Beard
Nut-lock.....P. Clay
Oil or grease cups, Attachment for plugs of.....J. Towers
Oil-tank cut-off, Automatic.....B. G. Jewell
Optometer.....J. E. Goodman
Ordnance, Breech-loading..A. T. Dawson et al
Ordnance, Firing mechanism for breech-loading.....A. T. Dawson et al
Ordnance sighting apparatus, 2 pats.....A. T. Dawson et al
Ore-concentrating jig and coal-washer.....G. C. Hackstaff
Ore-separator.....W. S. La Shells
Ore-separator.....R. M. Clark
Ores, Removing sulfur, arsenic, and other like impurities from refractory.....F. Cotton
Oven-bottom.....K. Webb
Ozonizer.....E. W. Smith
Package-holder.....F. M. Southwick
Packing.....F. Goetze
Pails, Bail-ear and cover-holder for..J. Dister
Paper box or carton.....E. T. Gowing
Paper cabinet or fixture, Toilet-.....G. T. Johnson
Paper-cutting machine.....D. T. Wadhams
Passenger control.....E. Linhardt
Pastry-making machine...E. H. Lanier et al
Pencil-sharpener and cigar-cutter, Combined..H. Eichler
Pencil-tips, Spring-protector for india-rubber..S. H. Crocker
Percolator.....F. J. Stayton
Photograph-mount, Postal-card....G. N. Pifer
Photographic-plate holder.....O. H. Talbott
Photographic purposes, Portable dark room for.....C. Burr et al
Pianissimo device.....W. G. Betz
Pinch-bar.....W. B. Hendrix
Pipe attachment.....W. E. Bush
Pipe clamp or coupling eollar...J. T. Everett
Pipe conduit, Steam-.....S. W. Hersey
Pipe-cutter.....R. Eck
Pipe-cutting machines, Reaming attachment for.....E. M. Buckius
Pipe joint, Dredging-.....L. W. Bates
Pipe-lines, Device for coupling and uncoupling sectional metallic.....L. T. Gillett et al
Pipe-threading machine.....C. M. Foster
Pipes, cigar and cigarette holders, Mouthpiece for.....E. Litchblau
Pitcher.....G. R. Paalen
Planter and fertilizer-distributer, Combined.....W. B. Parrish
Plaster, Structural surface for receiving and holding.....A. White
Plow.....A. Plankey
Plow and attachment, Sulky-....A. M. Belding
Plumh-bob.....W. Loeven
Plumbing-fitting.....F. B. Morton
Plumbing-trap.....P. F. Murphy
Pocket-book safety attachment..S. W. Wilson
Pocket-knife.....J. R. Heath
Polisher.....I. L. Dunn
Powder-puff box.....P. I. Shenberg
Power appliance.....M. C. White et al
Press-box.....R. Carlin
Printing-plates to type-beds, Fastener for securing.....B. F. Upham
Propeller, Ship-.....G. A. Schlotter
Propulsion, Boat.....G. Gays
Propulsion, System of hoat.....J. Rivers
Proteids and amins, Thermoplastic compound for.....B. B. Goldsmith
Pull-socket.....M. J. Flynn
Pulley.....L. Whitcomb
Pulling-over machine.....J. Armbruster
Pulp-board, Apparatus for producing reinforced.....W. W. Clark
Pulverizer.....O. C. Beach
Pump.....W. Patten
Pump.....L. L. Pratt
Pump.....M. Still
Pump.....W. S. Dobie
Pump, Steam vacuum-.....W. R. Emerson
Pumps, Cut-off valve for centrifugal.....S. V. Trent
Pumping plant, Sand-.....M. Swintek
Puzzle.....L. C. Koehler et al
Rack.....A. S. Walley
Rack.....W. M. Gilmore
Rail-anchoring device.....T. A. Weichel
Rail chair and fastening.....L. R. Garrard
Rail-clamp.....J. C. Crowson
Rail-drilling machine.....J. Weimer et al
Rail-end angle-bar.....W. C. Ellis
Rail-joint.....J. S. Foulkrod et al
Rail-joint.....R. Pelouso et al
Rail-joint.....J. B. Weever
Rail-joint.....W. R. Barney
Rail, Sectional.....O. P. W. Miehael
Rail splice and brace.....R. L. Abernathy
Rail-stay.....J. M. Vail
Rails, Track-fastener for.....R. B. Robinson
Railway, Electric.....W. G. Roome
Railway for parks, &c., Observation-.....J. B. Strauss
Railway, Pleasure-.....A. G. Sherk
Railway signaling system.....J. M. Waldron
Railway structure.....C. W. Reinoehl et al
Railway system, Tube-.....E. W. C. Kearney
Railway-tie.....F. D. Rathbone
Railway-tie and rail-fastener....D. N. Myers
Railway-tie and rail-fastener, Combined.....C. F. Snyder
Railway tie-plate.....A. Morrison
Rakes, Hoe attachment for.....P. Fairfield
Ratchet-drill.....J. Petterson
Razor-blade holder.....J. Kaufman
Razor-blade holder, Safety-...J. W. E. Laker
Razor, Safety-.....L. B. Prahar
Razor-stropping machine.....J. R. Dievendorf
Reaping, mowing, and like machines, Knife-blade of.....J. Squair
Receptacle, Collapsible.....M. J. Shaffer
Reclining-chair.....F. C. Tate
Registering mechanism, Device for the protection of.....T. Muller
Relay.....H. C. Rice
Relay, Polarized.....R. L. Dean
Resin and turpentine, Extracting...G. Walker
River-power,. Means for utilizing....H. Flynn
Rivet.....E. B. Simpson
Rocker, Removahle and adjustahle.....C. A. Druhman
Rod-coupling.....B. F. Cole
Roll, Hollow.....M. J. Whitlock
Roof-flashing.....H. K. Ulrich et al
Roost, Movable poultry-.....C. Stoner
Rotary engine.....A. J. Ruth
Rotary explosive-engine.....S. H. Conkey
Ruhber, gutta-percha, and their artificial substitutes, Agglomeration and regeneration of india-.....E. A. L. Rouexville
Safety-pin.....W. H. Farmer
Saucepan-lid.....L. S. Hine
Saw, Metal-.....H. G. Miller
Saw mounting, Gang-.....A. Jones
Scale.....O. O. Ozias
Scale, Platform-.....A. A. Van Meter
Scarf-holder.....H. A. Bateman
Scissors, Pocket cigar-.....H. Clauss
Score-card, Base-ball.....P. Meaney
Scow-unloading apparatus.....J. W. Reno
Screw.....A. C. Aichman
Screw-driver, Micrometer.....G. W. Bowers
Screw-driving machine.....E. P. Wanner
Scythe-snath.....H. B. Hewitt
Seal, Car-.....J. W. Bowers
Sealing machine, Envelop-.....D. B. Butts
Seat-spring.....E. L. Bean
Separating solids from liquids, Centrifugal machine for.....A. G. Eriesson
Setting.....H. Walker
Sewer-plug.....W. J. Gleason et al
Sewing-machine.....V. Sandahl
Sewing-machine apron.....L. C. Mattell
Sewing machine, Glove and fur.J. F. Wilhelm
Sewing-machine hemmer.....W. R. Parsons
Shade and eurtain bracket.....H. C. Hepler
Shade-holder.....L. R. Hopton
Shade-roller, Movable.....G. F. Kelsey
Shaft-aliner.....A. G. Holmes
Shaft or journal lubricator.....O. C. Knipe
Sharpening chuck, Drill-steel-.....J. H. and H. L. Sinclair
Sheet-metal tank.....C. H. Zwermann
Shelf, Book-.....T. C. Petersen et al
Shingling-gage, Adjustable...W. H. Smothers
Shoe.....J. W. Leaeh
Shoe and shank-piecc therefor.W. H. Baynard
Shooting-gallery.....O. R. Paine
Shoulder-brace.....J. Dorf
Shutter-bower, 2 pats.....H. Zimmerman
Shutter-bowers, Sill-plate for..H. Zimmerman
Shutter-fastener.....H. Zimmerman
Shuttle-thrower.....V. Bachman
Sickle-bar.....W. L. Kibbe
Sign, Multiple.....R. A. Miller
Signaling and telephone system, Combined automatic.....E. E. Salisbury
Signaling apparatus.....J. Melvin
Signaling system, Composite.....H. B. Stone
Signaling system, Electrical..A. D. T. Libby
Signaling system, Electrical.....J. G. Nolen
Signaling system, Electrical.....R. H. Manson
Sill-plate.....H. Zimmerman
Skid and truck, Comhined.....R. M. Pearce
Skiving-machine.....J. S. Turner
Sleigh and sled.....J. Rantasa
Slicer, Fruit-.....A. J. Curtis
Small-arms, Adjustable wind-gage rear sight for.....W. Bennett
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Mechanical movement....R. J. Forman
Mechanical movement....O. H. Slafter
Metal construction....W. P. Lawrence
Metallic linings, Making seamless....J. M. Burr et al
Metronome....C. A. White et al
Milk-container....G. W. Maxwell
Milking-machine....O. Mortensen
Mincing-machine knife....A. Gömory
Miter-box....W. H. Eastman
Mixtures, Apparatus for obtaining intimate....E. Dor-Delattre
Mortar-mixer....G. D. Scheiffler
Motor-control system....H. F. Stratton
Motors, Short-circuiting device for electric....C. A. Schnur
Mower attachment....S. E. Staal
Muffler cut-out mechanism....L. S. Chadwick
Music-holder....R. W. Mills
Music-roll container....L. Haas
Music-sheet turner....S. J. Shaw, Jr. et al
Musical instrument, Stringed....A. S. Leslie
Needle-lubricating device....J. B. Hadaway
Needles and the like, Holder for....F. W. Hawkes
Nozzle....G. L. Burden
Nozzle....H. B. Helm
Nuisance, Device for preventing dog....A. H. Roberts
Nut and bolt, Self-locking....M. Jacobs
Nut-lock....S. Truston
Nut-lock....L. T. Twyman
Nut-lock....R. F. Ross
Nut-lock....R. Scherer
Oil-can....T. W. Alexander
Oil-switch....H. L. Van Valkenburg
Ore-pulverizer....G. P. Good et al
Ore-treating furnace....C. C. Medberry
Ore-volatilizing furnace, Revolving....H. H. Hughes
Ores, Treating nickel....A. G. Betts
Oven, Camp-....W. H. Hart (Reissue)
Packing-box....G. Cerf
Packing for elastic-fluid turbines, Shaft-....K. Ahlquist
Packing, Metallic ring-....J. Sieger
Pail fastening and sealing device....C. C. Batchelor
Pail holder, Milk-....T. N. Oium
Pail stand, Foldable paste-....J. A. Jensen
Paper fruit-box....E. W. Cornell
Paper holder, Toilet-....J. Aspenleiter et al
Paper wrapper for moldings, &c...F. Kaufman
Pavement, Street-, 2 pats....S. E. Finley
Pen and pencil clip....F. C. Lowrey
Photographic dry-plate....L. Husson
Photography....F. W. Donisthorpe
Photography, Color....E. Clifton
Photometer....W. Herrmann
Pianissimo device....G. A. Wheeler
Piano-pedal and making the same.A. L. Ebbels
Picture machines, Automatic light-shield for moving-....D. C. Woodworth
Pile fabric, Woven....J. K. Dalkranian
Piling, Interlocking sheet-....C. S. Boardman
Piling, Metal sheet-....T. C. Jackson
Pipe-couplings, &c., Blank for the manufacture of middle rings for....G. H. White
Pipe-joint coupling....H. B. Hodge
Pipe-wrench....D. B. Edwins
Planter, Combination-....C. Linder
Planters and fertilizer-distributers, Broadcast attachment for....B. F. Cranwell et al
Planting-machine....M. C. McCoy
Plow....R. T. Huggins
Plow, Rolling-drum....J. P. Smith
Plug, Plumber's sanitary test-..W. Turner et al
Pocket-box, Combination....C. Jensen
Pole-piece-fastening device....J. D. Firmin
Pole-support....T. Haines
Post-card and fan, Combined picture....K. Münster
Potato-digger....J. Reuther
Potato-transmitting device....F. R. McBerty
Press....A. G. Fell
Printing and vending machine, Ticket-....F. W. Smith
Printing, Book-press for color-....N. P. Törnbladh
Printing-machine....A. B. Dick
Printing mechanism....R. A. Pollock
Projectile....E. Gathmann
Propelling vessels, Means for....F. Ishöy
Pulley attachment, Clutch-....W. C. Perry
Pulverizing or grinding mill...J. W. Fuller, Jr.
Pulverizing-roller, 2 pats....E. E. Porter
Pump, Hydraulic air-....P. Lewis
Pump or condenser, Air....H. Keller
Punch, Rivet-....C. L. Bean
Puzzle....A. R. Foss
Rail and gutter, Combined life-.J. F. Booraem
Rail-chair....J. C. Wise
Rail-fastening, 3 pats....M. F. Bonzano
Rail-joint....E. M. Smith
Rail-joint....C. R. Baldrige
Rail-joint, Insulating....B. Wolhaupter
Rails from spreading, Means for preventing..C. H. Magruder
Railway spike and lock....J. M. Jones
Railway-switch....R. L. Brewer
Railway-tie....L. F. Exner
Railway-tie, Metal....J. J. Pierce, Jr.
Railway-ties. Attachment for wooden....C. H. Bennett
Railways, &c., Underground subway for street-....G. W. Jackson
Rake attachment....W. E. Riley
Razor, Safety-....J. Reichard
Receptacle especially adapted for mustard....C. F. W. Lindewirth et al
Register....J. Frick
Registering the mean working pressure, Indicator for continuously....M. Arndt
Relay, Cable-....I. Kitsee
Rock-drilling engine, Water-feed, dust-laying..C. H. Shaw
Roller, harrow and cultivator, Combined....O. A. Gallatin
Rosette....E. Tregoning
Rotor construction....E. Mattman
Roundahout....C. D. Sauvé
Rug-holder, Porous....C. E. Knapp
Rule....C. Hansen
Sad-iron heater....W. A. Flatt
Saddle spring, Harness-....W. H. Aide
Safety device, Automatic....W. D. Gelser
Salt-cellar....H. J. Trimble
Sand-blast device....S. L. Young
Sandpaper-wheel....W. G. Liebig
Santalol esters....E. Spröngerts
Sash and window-locking device, Ventilating-..F. W. Hold
Sash-lock, Automatic....E. Heid
Sash lock, Window-....H. L. Corson
Sash-locking device....J. E. Gibbs
Sash or screen hanger, Storm, 2 pats....D. T. Peters et al
Saw-blades and means for attachment of the saw-blade thereto, Cap-plate for cylindrical..G. N. Williams, Jr. et al
Saw-blades and the attachment of the saw-blade thereto, Cap-plate for cylindrical....G. N. Williams, Jr. et al
Saw-grinder attachment....G. W. Pippen
Saw mills, Setting mechanism for twin band-..C. E. Cleveland
Saws, Sawdust-catching attachment for circular....D. J. Bemillar
Scaffold and derrick, Adjustable....M. Bailer
Seal, Snap-, 2 pats....E. J. Brooks
Separator-sieve....H. Shupert
Sewing-machine, Binding-....J. P. Weis
Sewing-machine feed mechanism....F. W. Merrick
Sewing-machine needle-plate....N. Woolsey
Sewing-machine take-up....F. F. Dorsey
Sewing-machine thread-controlling mechanism, Button-....B. T. Leveque
Shade-bracket....H. Arnold
Shaft-collar....G. A. Donahue
Shaft-coupling....E. C. Griffin
Shafts, Machine for cutting keyways in....L. Goad, Jr. et al
Shear-table and actuating mechanism therefor..F. C. Biggert, Jr.
Ship's-draft-indicating means....F. I. Meno
Shoe....J. E. Shawhan
Shoe-cleaning device....R. Henry
Shoe-fastener....C. P. Topliff
Show-case....L. Spady
Sight....J. T. Peddie
Sign-holder....G. Huneryager
Sign, Illuminated....M. C. Ryan
Sign, Movable advertising-....J. H. La Pearl
Signaling system....J. Means
Siphon....W. Harrison
Skate....A. J. Kennedy
Skirt-marker....H. Wells et al
Skirt-marker....L. D'Elia
Slack-adjuster, Automatic....C. O. Anderson
Sleeve, Splicing-....H. Frankel
Slicing machine, Bread-....G. A. Kinder
Sliding gate....W. W. Wasden
Slip-coupling....E. J. Gulick
Smoke-consuming furnace....P. J. Flanagan
Snap-hook....W. Gronke
Soap holder, Liquid-....H. W. Burgner
Socket-fastener....E. L. Miller
Soy or sauce substitute, Manufacturing....K. Okazaki
Speculum....C. H. Borden
Speed-adjuster....L. R. Culver
Speed-controller....W. J. Seitz
Spindle....J. N. Kelsea
Spoke....T. H. Walbridge
Spring-wheel....E. B. Anderson
Spring-winding tool....A. Worcester
Sprinkler system, Automatic....J. P. Casey
Stadia-reading apparatus....E. J. Young
Stalk cutter, Raspberry and similar....M. B. Sherman
Station-indicator....H. C. Wallace
Steam-generator....H. Ritchie
Steam generator and heater....F. L. Dutcher
Stencil-machine....G. Remsnider
Stoves, lamps, &c., Attachment for gas....W. A. Caldwell, Jr.
Strain-resisting mechanism....G. H. Forsyth
Strainer for lubricating system.C. H. Worsey
Stream-motor....R. Wilson
Stream-motor....P. J. Hansen
Street-cleaning machine....F. B. Dickason
Suit-case attachment....T. Cosgrove
Sulfocyanids, Manufacture of...K. M. Chance
Surgical device....C. E. Eckrode
Swing attachment....M. R. Grant
Tabulating mechanism....S. J. Quincy
Tag or check....A. S. Rheaume
Talking-machine stand and horn, Combined...H. C. Miller (Reissue)
Tank-heater and feed-cooker.J. S. Christensen
Tank indicator, Liquid-fuel-...S. H. Peckham
Target-trap....S. A. Huntley
Teazling cloth, &c., Device for...S. Grimson
Telegraph, Printing-....I. Kitsee
Telegraph-transmitter....T. J. Dunn
Telegraphy....T. B. Dixon
Telephone system....A. H. Dyson
Telescope for indicating ships' oscillations, Sighting-....H. C. Mustin
Telescope, Hinged double....E. Dönitz
Theatrical effects, Means for producing....A. F. Sallé
Thermoplastic keratin composition....B. B. Goldsmith
Threshing-machine feeder....J. H. Schlenter
Threshing-machine separator....R. McLaughlin
Ties, Means for securing splice-bars to....M. F. Bonzano
Ticket, Railway-....R. A. Smith
Time-recorder....A. P. Schmucker
Tire cover, Spare-....H. Cohen
Tire, Pneumatic....F. Reddaway
Tire-protector....E. J. Weidner
Tire-tool....J. A. Swinehart
Tire, Vehicle-....A. M. MacFarland
Tire, Wheel-....A. R. Bangs
Tool, Hand-....A. G. Lamb
Toy....L. W. King
Toy spinner....W. Bohn
Toy vehicle....H. T. Kingsbury
Toy, Wheeled....J. B. Spencer
Trace-fastener....B. F. Woodhouse
Train or vehicle, Electric....J. L. Creveling
Transportation system, Elevated..A. E. Brock
Trowel....J. W. Denton
Truck, Car-, 2 pats....C. S. Shallenberger
Truck, Railway-....A. M. Clark
Tube-forming machine....L. C. Smith
Turbine, Elastic-fluid....H. J. Hanzlik et al
Turbines, Nozzle for elastic-fluid..J. G. Callan
Turn-table....H. M. Verplanck
Type-bar, Justified....F. H. Richards
Type-writer-ribbon-handling device....E. C. Magnus
Type-writing and calculating machine, Combined....H. D. Bolton
Type-writing machine....G. C. Carhart
Type-writing machine....O. Woodward
Type-writing machine....E. E. Barney
Type-writing machine, 2 pats..F. W. Hilliard
Type-writing machines, Decimal-spacing mechanism for....C. F. Leganke
Type-writing machines, Variable carriage-feed for....J. A. Smith
Umbrella, Folding....A. Loukota
Valve....C. F. Fernald
Valve....W. C. Westaway
Valve, Automatic shut-off....A. T. Gries
Valve, Gate-....A. P. Smith
Valve-lock....L. Toback
Vamp-trimming machine....J. B. Hadaway
Varnish-gum and producing same.J. J. Kessler
Vehicle brake-operating mechanism, Motor-....P. Krause
Vehicle exhaust-dissipating apparatus, Motor-..G. E. Whitney
Vehicle for hospital and other purposes....W. F. Bernstein
Vehicle front or platform gear....J. Erret
Vehicle-spring....L. C. Burnet
Vehicle-spring....E. L. Barton
Vehicle steering and turning device....J. M. Eadie
Vehicle-wheel....E. S. Kintz
Vehicles, Device for automatically stopping....S. H. Cluxton
Velocipede....R. V. Jones
Veneering-drying apparatus....G. M. Walker
Vessel-hull construction....E. S. Hough
Vibrating screen or separator.W. T. Bell et al
Vise, Bench-....P. F. Wray
Voltage controller, Multiple-....E. W. Stull
Voting-machine....B. F. Eilerman et al
Wagon brace, Dump-....P. H. Soentgen
Wagon-jack....G. W. Harris
Wagon-seat....A. A. Vik
Washer or button feeding attachment for setting-machines....E. B. Stimpson
Washing-machine....A. Hofmann
Washing-machine....G. R. Adams
Watch....A. Pfister
Water-closet seat....W. S. Emery
Water-glass....W. E. White et al
Watering device, Stock-....G. E. Odell
Watering tank, Stock-....A. N. Eaton
Wax-extracting apparatus..E. C. Smith et al
Weather-strip....C. B. Ford
Welding, Electric....M. Lachman
Welding of aluminum, Flux for the autogenous....M. U. Schoop
Wheel....G. M. Badger
Winding and cleaning silk and other fibers, Apparatus for....E. Dubini
Winding-machine guide-motion, Quill-....E. E. Bradley
Window-fastening device....L. H. Vogel
Window-lock....J. E. Hissong
Window-pane fastener....J. B. La Venture
Wire bed-bottom, Woven-....G. Boehm
Wire-drawing, Plate-stand for.P. Vanderauwera
Wire-gripper....J. H. Reece
Woven fabric....T. Taylor
Wrench....C. O. Bean et al

DESIGNS.

Badge....C. J. Dieges
Badge....J. W. Green
Badge....E. J. Kassel
Border-section....C. Graff
Burial-casket....J. Topol
Card blank, Show-....E. G. Soltmann et al
Gem-setting....I. D. Belasco
Gem-setting....L. Kraus
Grave-marker....A. P. Stults
Inkstand....C. H. Numan
Lace edging....W. E. Keach
Lamp, Inverted hydrocarbon-vapor.J. J. Meyer
Mandolin....A. Stathopoulo
Medal....R. Marschall
Metal ornament....J. W. Anthony
Oil-burners, Prismatic glass cone for....E. F. Gennert
Spoon, fork, or similar article..G. Strohhaker
Toy....F. M. Snow

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MECHANICAL PATENTS.

Advertising apparatus....L. U. Cornelius
Air-cooling apparatus....W. A. Merralls
Air-purifier....H. A. Robinson
Alcohol, Making....A. Woolner, Jr. et al
Alloy, Silicon....J. T. H. Dempster
Amusement apparatus....O. M. Connelly et al
Amusement apparatus....F. S. Chance
Animal-dipping apparatus....J. A. Willits
Antidrifting device....E. Gunnell
Antiskidding device....L. J. Clergy et al
Antislip device....W. M. Stevenson
Armature construction....B. A. Behrend
Asphalt-heater....J. F. Driscoll et al
Automatic load-discharging elevator....O. A. Green
Automobile-motor....M. and W. Eastman
Automobiles, Continuous-track-light attachment for....J. M. Pitney Jr.
Automobiles, Power-transmitting mechanism for....L. P. Mooers (Reissue)
Axle-skein....U. H. Brown
Bait or lure, Fish....E. J. Lockhart
Balance or scale, Prescription...W. W. Dryden
Balancing-machine, 2 pats....N. C. Bassett
Bale and package tie....W. P. Watkins
Barrel....J. W. Strehli
Bearing for the shafts of delicate instruments..J. Johnson
Bearing, Roller-....E. L. Sharpneck
Bed and divan, Combination folding....W. E. Ingraham
Bed, Couch-....G. F. Sisbower
Bed elevator and rest, Hospital-..J. M. Hopkins
Bed, Invalid-....A. C. Taylor
Bed joint, Metal-....G. Adams
Bed-moving machine....W. H. Fulton
Bed-springs, Safety releasing-clamp for baled..J. Bernstein et al
Beds, Fracture apparatus for use with invalid-....C. S. S. Barrows
Belt-fastener....R. Maxwell
Belt, Power-transmission....L. Onderdonk
Bench clamp or vise....E. P. Bridges
Billiard-table, Convertible pocket-carom....H. F. Davenport
Blackboard tray attachment....J. W. Hainline
Block-press....E. Sprenger
Block-signal system, Automatic electric....H. W. Price
Block-signal system, Electric-railway....M. E. Launbranch
Block-signal systems, Automatic train controlling and signaling mechanism for....H. W. Price
Blood-draining tube....C. B. Doldge et al
Blower, Steam-jet....C. T. Coe
Bond-compressor....W. H. Finley
Box attachment....H. W. Stuver
Box-lid support....E. Oswald
Brake-beam....H. Ziemss, Jr.
Brake-shoe....B. Péducasse
Brick-drying apparatus....W. F. Decker
Bridle-blind....F. T. Moore
Bridle crown-piece....J. T. Hegland
Broiler....L. Fey
Buckle, Cross-line....G. R. Bair
Building construction....J. Gibson
Burglar-alarm....E. Schwab
Bushing....E. Kaufmann
Butt-hook....E. W. Smith
Butter-cutter....F. J. Macnish et al
Cable, Elastic wire....T. W. Colleran
Cable-stripping machine....J. W. Gisriel
Camera....A. M. Henry
Can-body and blank therefor....F. Wegner
Can-body-making machine....F. Wegner
Can-opener....A. F. Fitz Gerald
Car and engine replacer....J. Flynn
Car-body construction....L. G. Nilson
Car-brace....W. I. Taylor
Car brake, Mine-....I. Glen
Car-derailing device....W. M. Mitchell
Car draft and buffing gear....I. O. Wright
Car, Dump-....S. Otis
Car-fender....P. Susseles
Car-heating system....T. Parker
Car-seat....M. M. Murchison
Car-seat-operating device....M. M. Murchison
Car station or street indicator..C. M. Dickinson
Car-ventilator....G. C. Breidert
Cars, Current-collector for electric....G. Mertens
Carbureter....G. F. Schmidt
Carpet fastener, Roll-....W. L. White et al
Cash-register....A. H. Heltberg
Cattle-guard....D. Thomson
Cattle-guard....J. H. Hammill
Cement ingredient....W. V. B. Ames
Chafing-dish, &c., Collapsible stand for....L. K. Sone
Chain-link-welding machine....L. Roehr
Chains, Apparatus for molding solid-link....W. C. Herron
Chair and stool....L. E. Hubert
Chandelier, Gas-....G. E. Kaschub
Checkrein-holder....R. E. King
Christmas-tree holder....C. E. Singleton
Chuck, Spiral....G. B. Taylor
Churn....A. Griggs
Churn, Vibratory....W. Sanders
Cigar-pressing apparatus....K. Wimmer et al
Circuit-closer for recording-anemometers....J. C. Jurgensen
Cistern and well pump casing....J. S. Shea
Clamp....C. B. Wanamaker
Clamp....M. Calvin et al
Cleaning apparatus....W. C. Mayo et al
Clevis....W. S. Smith
Clip....C. M. Mockbee
Cloth-bolt holder....E. T. Flemister
Cloth-piler, 2 pats....A. Ratner
Clothes-pounder....J. Q. Deal
Clutch....L. Atwood
Clutch and brake mechanism..F. S. Ellett et al
Clutch mechanism....A. F. Jackson
Coat-hanger....I. Geraci
Coke-drawer....H. Cory
Coke-drawing apparatus, 2 pats...C. M. Clarke
Collar fastener, Horse-....T. W. Hardy
Comb....A. M. Young
Combustion-engine....H. H. Cutler
Composing-machines, Assembling mechanism of typographical....J. E. Billington et al
Composition of matter....C. A. Goldsmith
Computing-machine....O. D. Johantgen
Concrete, Hanger-socket for reinforced....F. N. Kneas
Condenser....W. A. Moffatt
Condiment-holder....H. W. Watson
Contact-plow support....S. T. Bole
Conveying apparatus....J. T. Cowley
Conveying aparatus....J. M. Hore
Cooker....M. M. Newsam
Cooking and canning tank..H. L. Cunningham
Cooking utensil....E. C. Rose
Cord-holder....C. Planette et al
Corn-heading machine, Kafir-....J. Norris, Jr.
Corner-bead....M. A. Hannon
Corset....J. Lindauer
Cotton-compress....C. J. Luce
Cotton-picker....L. I. Hamilton
Cotton-picker, Hand....H. E. Fourcher
Cotton-gin....F. T. Kent
Crane....C. G. Sprado

Crane, Electric traveling.....E. E. Brosius
Crate or box, Knockdown.....J. F. Myser
Crate, Poultry-.....D. Turner
Crutch.....S. T. Glasford
Cuff-holder.....C. Walker
Cultivator.....W. D. Gaston
Cultivator.....A. C. Lodwig et al
Current motor, Alternating-, 2 pats.....E. F. W. Alexanderson
Current motors, Protective device for commutator-type alternating-.....B. G. Lamme
Curtain-fastener.....H. Higgin
Curtain-fixture.....F. H. Bassett
Curtain-fixture.....H. E. Keeler
Curtain-hanging fixture, Adjustable.....R. C. Davie
Cuspidor, 2 pats.....F. W. Kendall
Damper-regulator, Automatic...G. Furuholmen
Density-determining apparatus...W. D. Mount
Depositing-machine.....E. Hérissé
Developing-tank.....J. G. Lavender
Diffusion apparatus.....W. Bock
Dilator.....J. W. Shults
Dipper and server.....C. C. Williams
Dish-washing machine.....H. D. Thomas
Display-rack for garments and the like.....H. E. Reyher
Display-stand.....J. Gullong
Ditching-machine.....F. Clayman
Door-hanger.....I. Johnson
Door hanger and hood, Sliding-.....M. Richey et al
Doughnut-drainer.....G. H. Trepanier
Draft attachment for vehicle-gears.....G. Streich
Draft-equalizer.....V. H. Boring
Draft-rigging, Friction.....C. A. Tower
Drain-pan.....A. Johnson
Drawer attachment, Desk...L. C. Walker et al
Drill, 2 pats.....M. Hardsocg
Drive mechanism, Variable-.....S. B. Gray
Dyeing apparatus.....R. Diederichs
Dynamo-brushes, Production of carbon-covered metal sheets for.....J. F. P. Ringsdorff
Electric cut-out.....T. E. Murray
Electric machine, Dynamo-..B. A. Behrend et al
Electric machine, Dynamo-.....C. E. Lord
Electric-motor.....E. F. W. Alexanderson
Electrical-connection rosette.....J. L. Burton
Electrical connections, Protective conduit-holder for.....J. F. McElroy
Electrical controller.....H. A. Steen et al
Electrical machines, Winding for..B. G. Lamme
Electrolytic arresters, Ground-leg connection for.....E. E. F. Creighton
Electrolytic cell or condenser.....E. E. F. Creighton
Elevator automatic control device.....L. J. Milke
Elevator-bin-slide controlling device.....F. R. McQueen
Elevator safety appliance....H. Piéron et al
Engine.....F. Franklin
Engine.....W. J. O'Keefe
Engines, Jump-spark plug for explosion-.....W. W. King
Envelop.....B. Joachim
Envelop closing-cords, Machine for attaching merchandise-.....W. E. Swift
Envelop, Document-filing.....O. G. Law
Envelop-machine.....W. S. Metcalfe
Envelop-machine.....W. D. Slater
Excavating buckets or shovels, Tooth for....A. H. Exton et al
Excavating-machine.....E. J. Mundale
Excavating-shovel.....H. G. Butler
Excavator.....E. Hoy
Expansion-motor.....G. Meyersberg
Explosive.....E. A. Le Sueur
Explosive-engine.....R. W. Coffee
Extension-table.....A. H. Stone
Eyeglasses.....J. Friedlander
Fabric-roll-edge protector....G. W. Loughman
Fare register and recorder.....W. I. Ohmer
Feed-mixing machine.....C. Dabney
Fence machine, Wire-.....J. L. Claudin
Fence-making machine, Wire-...J. M. Denning
Fence-wire-releasing device.....F. Cummings
Fender.....J. E. Horner
Fibrous material with liquids, Apparatus for treating.....H. Thies et al
Filing system, Vertical.....J. Dannheiser
Filter, Oil-.....A. Winton
Fire-escape.....E. Miller
Fire-extinguishers, Exchangeable container for chemical.....H. Mikorey
Fire-lighter.....H. O. Baddley
Firearm.....H. Poettich
Firearm-hammer indicator.....F. C. Chadwick
Fireplace, Portable.....P. Bernstein
Fireproof floor (concrete beam).....J. H. Magdiel
Fishing-gig.....L. C. Perry
Fishing-line reels, Attaching device for.....E. W. Kurtz, Sr.
Floor-scraper.....C. W. Johnson
Floor-smoothing machine.....A. Child et al
Flower-pots and the like, Attachment for.....M. C. A. C. Kroeger
Fluid-pressure engine.....J. C. Fleming
Fluid-pressure heat-engine..A. Whiteway et al
Fly-paper holder.....R. E. Fee
Fly-trap, Vacuum.....I. A. Myser
Folding box.....F. E. Sterrett
Folding table.....M. A. Drees
Fork.....G. J. Russler
Frames and the like, Corner connection for...C. Sewarting
Furnace.....D. C. Artman
Furnace.....M. J. and H. B. Farquhar
Furnace and heater.....J. A. Penney
Furnace-front.....J. Howden
Furnace-regulator, Automatic.....M. J. and H. B. Farquhar
Furnace slag, Machinery for conveying blast-..E. A. Uehling
Furniture, Article of.....F. X. Faller
Furring, Metallic.....A. Fontaine
Fuse and switch box, Combined.....W. R. Vanaman
Fuse-plug.....G. W. Goodridge
Gapped wheel.....F. Wagner
Garment-clasp.....L. C. Stukenborg
Gas appliance, Safety.....F. Grott
Gas-engine, 2 pats.....C. G. Sprado
Gas holding and administering apparatus.....G. von Ach
Gas mixing and administering apparatus.....G. von Ach
Gas-jet regulator.....C. J. Johnson
Gate.....J. M. Seay
Gear for motors, Change-speed.....P. Evans
Gear, Variable-speed.....J. Sturgess
Gear, Variable-speed.....P. C. Williamson
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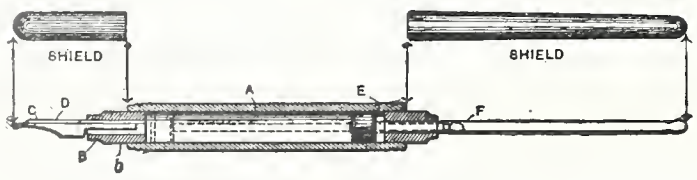
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THE WORLD'S MOST ACCURATE WATCHES.

By FRANK C. PERKINS.

A POCKET CHRONOMETER with Tourbillon escapement was recently tested at the National Physical Laboratory at Kew, and after an exhaustive six-weeks' trial in every possible position, and in variations of temperature from 40 degrees Fahr. in a refrigerator to 90 degrees in an oven, it obtained 94.9 marks out of a possible hundred. It is stated that this watch maintained the time within the 20th of a second per day of the finest marine chronometer ever tested at Greenwich, and it is held that a marine chronometer is only tested in one position. Its main variation of daily rate was only one-eighteenth of a second, the error at this rate being 2.7 seconds per month.



FIG. 1.—WATCH-TESTING APPARATUS.

The maker of this watch was M. Paul Distisheim, of La Chaux de Fonds, Switzerland, and the accompanying illustration, Fig. 1, shows the apparatus for recording the effects of barometric pressure on chronometers. Fig. 2. shows his registering chronometer for the observation of solar eclipses. More than three score prizes have been granted to this Swiss inventor in contests at the Neufchatel and other observatories.

The apparatus for testing the effects of variations in pressure on watches consists of a bell-shaped jar with supports for the chronometer and thermometers, and with a valve at the top and a tube connecting with a manometer. The chronometers were exposed to increasing pressures by degrees of 100 millimeters of mercury up to 800 millimeters. It was determined from the test of 7 watches that the variation is in direct proportion to the pressure. It is most interesting to note the high degree of precision obtained by this Swiss watch maker in the construction of instruments for measuring time.

The means employed generally for ensuring the accuracy of chronometers and astronomical clocks, are most elaborate. One of the chief clocks at Greenwich, which is used for regulating watches over half a hemisphere, is fixed to the northern wall of a magnetic basement, where the temperature is so artificially controlled that it is kept absolutely uniform. The thermometer of this clock is provided with barometric as well as thermometric compensation.

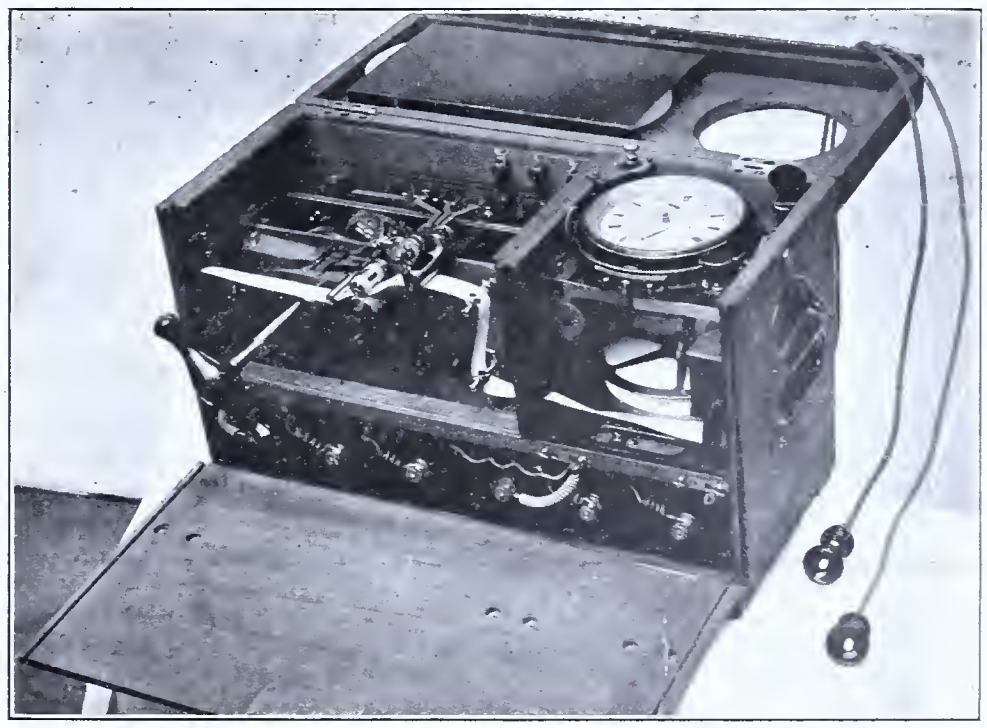


FIG. 2.—SOLAR CHRONOMETER.

The standard clock in the observatory at Leyden is kept in a large hall, enclosed in two wooden cases, placed in a niche cut in the pier of a 10-inch refractor. Further, to guard against sudden changes of temperature, the niche is closed by a glass door. In the Naval Observatory in this country there is installed a clock with a nickel steel pendulum, the impulse to which is through the suspension spring. This is enclosed in an air-tight glass case, and mounted in a vault where the temperature is artificially controlled. It is a long step from the hour glasses, sun dials, and clepsydras, or water clocks, which our forefathers used to measure time, to these masterpieces of delicate workmanship, sensitive to a breath.

To Supply an Army.

One of the most difficult problems which army officials are called upon to solve, is the method of transporting food and other supplies for troops on the march. An essential factor in the success of an army in the field resides in its mobility, and this is best ensured by reducing the number of wagons needed for carrying provisions, ammunition, etc. Recent experiments have been made by the War Department, looking to the adoption of the types of vehicle best suited for these purposes. One of these was a wagon that could, at any point desired, be converted into a wireless telegraph station. Portable telegraph and telephone stations have long been known, and were found of great use in the war in South Africa and that between Russia and Japan. A new feature is the military balloon train. Arrangements have been made for carrying these balloons into the most inaccessible places, and inflating them in the field by extracting the condensed gas from metal tubes which are filled at the permanent plant.

There is also one portable gas generator for the balloon train, and it will not be long before there will be facilities for taking aeroplanes into the field, although many military authorities regard the dirigible balloon and the flying machine as of restricted value to an army, to be used mainly for observation purposes and not for the wholesale destruction of cities or the obliteration of fleets or armies by devastating fire from above.

The soldier of the immediate future will not be restricted to hard tack and canned meat, with coffee and sugar tablets. A large army on the march may now be supplied with freshly baked bread, hot soup, palatable meats and vegetables, without building a campfire and warming up tinned foods. These marvels will be accomplished by the various kinds of wagons that accompany the troops. There is the soup cart, an idea borrowed from the Russians. It consists of a huge tureen mounted on two wheels and drawn by a horse. Then there is the rolling oven, in which a fire burns as the vehicle follows the columns, and from which the bread can be taken, baked to a turn, when the camp is established.

The fireless cooker, several descriptions of which have appeared in the INVENTIVE AGE, has an important function as a peripatetic kitchen. Certain articles of food, partly prepared, are placed in the boxes and cooked with retained heat, being ready for issue at meal time. A collapsible metal field oven, an ingeniously contrived folding cooking device, may be carried in compact form and set up ready for use in any remote place. Of the same class is the folding bread trough and telescopic wagon, which has the joint function of serving as a camp cookhouse and being easily converted into a bunkroom. This wagon on the march has the appearance of an ordinary military vehicle drawn by two horses; but it can be pulled out to an elongated floor, by means of a series of slides, forming the bottom of the wagon.

Of the same nature as the food wagons is the water vehicle. This is a tank containing sterilized water, to which the men have access by means of faucets around the base, or nozzle fountains that permit drinking without using the common cup. It is important, of course, that an army in the field should be protected from the dangers of drinking impure water, and in unfriendly territory, water that has been purposely contaminated. There is also the portable sterilizer, and the mounted incinerator for the destruction of garbage and refuse. One of the most valuable accessories is the emergency hospital station, which is a marvel of the collapsible, and represents the last word in the line of condensation, although it includes an X-ray cart containing apparatus for taking these scientific pictures as an aid to surgery in the field.

Electrical Shoe Polishers.

Soon the boot block will exclaim, like Othello, that his occupation's gone. The latest wrinkle is to have your shoes shined by electricity. You step up to a machine, which looks something like the automatic weigher, insert a foot in the proper opening, press the button, and in less than a minute the shoe is beautifully polished. On either side of the platform is a brass rail by which the patron can steady himself. First a set of brushes cleans the dust and mud from the shoe; a liberal coating of blacking is then applied through tubes, and another set of brushes rubs the leather briskly until it shines. The other foot is then inserted and the operation repeated. Although the patron pushes the button twice, he has to drop in but one nickel, as the mechanism is provided with a double release. One of these devices, installed on Broadway, New York, is patronized by 2000 people every day.

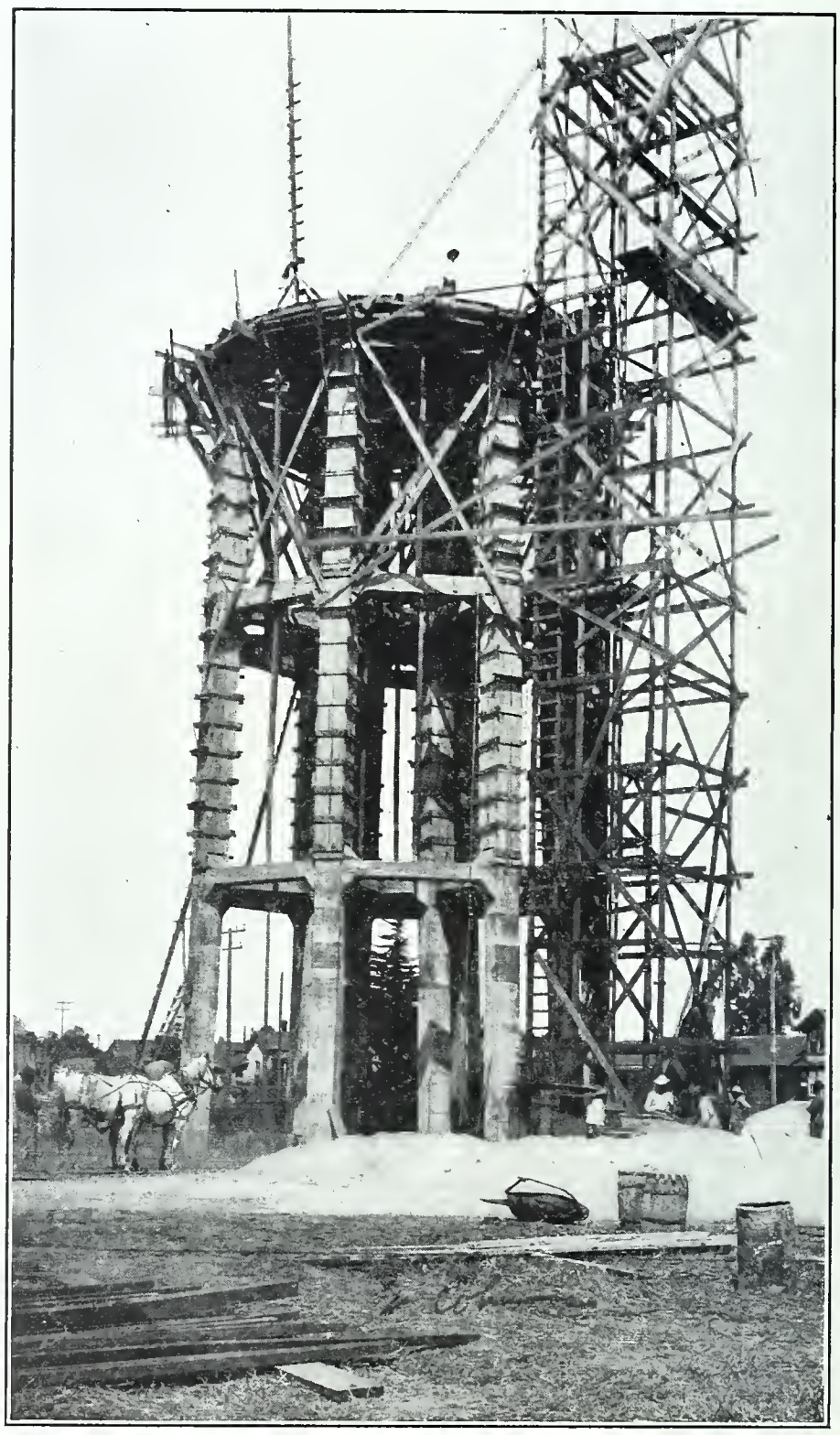
The Tallest Building in the World.

The huge structures of steel and stone that tower over our cities will shortly rival mountains in height. There seems to be no limit to the ambition of our architects. Hardly has the world recovered from its surprise at one of these monsters, before a still loftier one is designed. The latest is to be built in New York by the Equitable Life Assurance Society. With its tower, as planned, it will have 62 stories and reach 909 feet above the curb. The flag pole will run up 150 feet higher. The building will cost $10,000,000, and the plans call for a main structure of 34 stories, reaching a height of nearly 500 feet. Above this the tower will rise heavenward 420 feet, having 28 stories. It will be constructed in two sections, one extending from the 34th to the 49th story, and the other, a narrower one, rising from the 49th to the 58th story. The cupola will soar 4 stories above this. When completed, it will be the loftiest building in the world, overtopping by more than 200 feet the Metropolitan building.

A WATER TANK MADE OF CONCRETE.

By CHARLES ALMA BYERS.

At Anaheim, California, for the Anaheim Water Co., there has recently been completed a water tower and tank built entirely of concrete, said to be the only construction of the kind in the world. It was built under the supervision of Carl Leonardt, a Los Angeles contractor, and from plans designed by an engineer by the name of Schenk. The structure is graceful in outline, and at the same time presents a pleasing appearance of massiveness and solidity. From the lowest part of the foundation to the extreme top of the cone-shaped roof it has a height of 112 feet. Its aggregate cost was $11,400, which is a about three-fourths of the lowest estimate on a steel tank and tower of equal dimensions.



THE CONCRETE TOWER IN PROCESS OF CONSTRUCTION.

The tank has a water capacity of 200,000 gallons. It is thirty-two feet in diameter and thirty-eight feet high, supported on concrete posts, or a frame, seventy feet high above the ground. The walls of the tank are but three inches thick at the top and five inches thick at the bottom. The concrete is reinforced throughout with rings and vertical members of twisted steel. The surfaces are smooth and gracefully rounded, and are as compact as those of a piece of earthenware.

The floor of the tank is supported by concrete beams radiating from the center, and twelve posts. The latter, each sixteen inches square, are stiffened by two lines of struts at equal intervals above the base. The foundation of the tower consists of a heavy slab of reinforced concrete extending four feet into the ground. The tank has a cone-shaped roof, also of concrete, only two inches thick, with a cornice over the edge, slightly raised to give ventilation to the water within



THE TANK AND TOWER COMPLETE, 112 FEET IN HEIGHT, CAPACITY OF TANK 200,000 GALLONS, COST $11,400.

When tried and tested, after its completion, the tank was found to be as tight as a bottle, without either cracks or leakage of any kind. Mr. Leonardt is one of the leading and most successful concrete contractors in the West, and is known throughout the Southwest as the "concrete wizard." In speaking of this structure, he said: "There is not the slightest danger of its not being durable. It is simply a jar built of concrete of superior quality, and is as water-tight as a piece of earthenware. Weather will have no effect upon it, nor will it be impaired by being permitted to stand without containing water."

Since the work is cheaper than steel, and is just as durable, if not more so, because of the tendency of steel tanks to rust, concrete water tanks will probably become very popular. As a building or construction material, concrete is being more and more appreciated every day, and its possibilities cannot even be conjectured. The future holds in store for this material even greater things, no doubt, than the realization of Edison's prediction that we will some day be living in "poured" concrete houses.

To keep themselves posted in the progress of the arts in which they are interested, inventors and manufacturers should subscribe for the INVENTIVE AGE, which publishes a list of all patents issued each month. The low subscription price and the character of the publication, entitle it to the support of all the inventors of the country.

To Fight Airships.

When the submarine was invented, methods were at once devised for combating this new weapon of warfare, and now that the world is about to adopt airships as accessories to its armies, a gun has been invented for use against them. The gun is mounted so that it can be pointed directly upward if necessary, mirror sights being arranged so that the gunner is not obliged to change his position in getting his aim. The gun is mounted on a motor car with a 60-horsepower motor, capable of traveling 45 miles an hour, which is fast enough to keep up with any vessel of the air so far devised. Five men and the gun are enclosed in armor plating, and the range of the gun is 8,500 yards at an elevation of 43 degrees. The machine is capable of carrying ammunition consisting of 100 shrapnels, each containing 128 lead bullets and 27 pieces of lead. The total weight of the destroyer, loaded, is about three tons.

Moving Pictures by Daylight.

One of the drawbacks to the popular moving picture shows is the fact that they cause strain on the eyes, this being partly due to the constant vibration involved in the rapid changing from one view to another, and partly to the glaring reflection from the white screen upon which the pictures are thrown. Efforts are being made to improve the character of this form of entertainment, and the latest is the exhibition of moving pictures in the open air, by daylight, or in a room only slightly illuminated. The screen, for daylight light views, is slightly tinted, and is arranged like the scene of a theatre, in the frame of a pair of folding doors, the protection apparatus being concealed from the spectators, who occupy a room lighted by large windows. Good results have also been obtained in Europe, where this experiment was tried, when the apparatus was set up in a shed, the audience being in the open air. Another improvement consists in throwing the image on a translucent screen between the spectators and the light, which screen forms the front wall of the projection chamber. If the screen is of ground glass, the ground face is turned toward the audience. The pictures, it is reported, were seen very distinctly, especially on a slightly cloudy day.

New Artificial Fertilizer.

One of the newest industries in the neighborhood of Niagara Falls is the manufacture of lime nitrogen. Coke and lime are combined in an electric furnace, the resulting compound being in turn pulverized and united in another electric furnace with nitrogen from the air, secured by a process involving the application of liquid air. The materials thus obtained contain 20 per cent in weight of nitrogen, the balance being the coke and lime compound which serves to bind the nitrogen. This compound is calcium cyanamide or lime nitrogen, and when sown in the soil it decomposes and dissolves in contact with the soil moisture, is absorbed through the roots of the plants, and becomes a valuable constituent. Three years of actual use upon farms in Europe have proved the value of this substance in connection with wheat, corn, oats, barley, rye, rice, tobacco and other crops. Some crops have been doubled by its use.

The factory which is being erected for this new industry will have a capacity of 5,000 tons. Plans are already in preparation for the establishment of a plant of 20,000 tons capacity.

Silendum: A New Material.

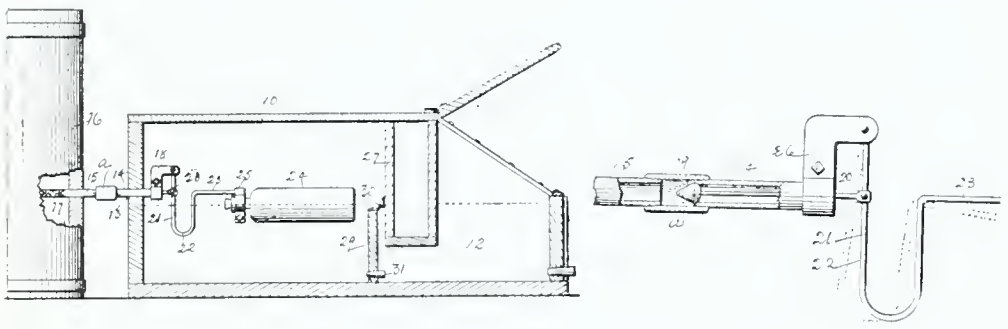
Whistler, the artist, is quoted as saying "If silicon had been a gas, I might have been a major general." It is fortunate for art, says the *Literary Digest*, that Whistler's disastrous examination in chemistry at West Point, which so abruptly put an end to his military career, was not postponed until today, for we now easily vaporize silicon in the intense heat of the electric furnace, and his celebrated answer might well have passed muster. A new material for domestic and industrial utensils, of remarkable hardness and resistance, may be formed by saturating carbon with this gaseous silicon. By a process recently patented, it is possible to convert any piece of carbon, in the form of rods, bricks or crucibles, into silicon carbid. This had been previously known only in the crystalline state, as carborundum, and it was supposed that it was formed by the sublimation of carbon and silicon. The inventor, however, found that silicon would penetrate into carbon when both were highly heated. Silendum, as the new material has been named, is therefore a product that is obtained when carbon is heated in the vapor of silicon. Silendum is fireproof to a high degree, and cannot be melted. The first use to which it has been applied is in electric cooking and heating, which demand a more advanced temperature than could be obtained with ordinary resistance wires. These operations have developed enormously in recent years, and as electrical energy becomes cheaper, there will be a large demand for electric ranges, to be used like a gas range. The electric range involves a concentration of electric power that cannot be obtained at present without overheating the wires or increasing the weight of the heating plates. Silendum can be used at the high temperature required for the purpose, and thus ranges are produced that have the glowing heat of a coal fire, and are used exactly like those heated by coal. It can be employed at as high a temperature as platinum, and as it is inexpensive, the apparatus is cheap both in first cost and in repair.

CLEVER NEW PATENTS.

AUTOMATIC HOG-WATERER.—FUEL CONVEYOR FOR FURNACES.
BLIND HINGE.

Automatic Hog-Waterer.

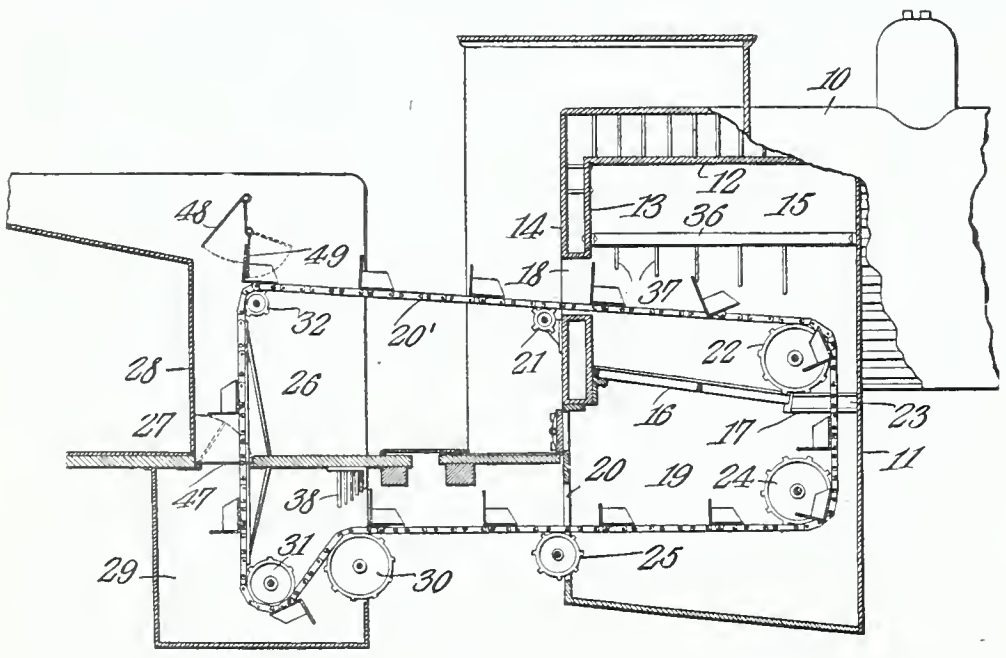
Charles Pelmulder, a well known inventor of Grant City, Ia., has recently secured protection for an improved automatic hog-waterer. The illustration shows to the right the valve, valve support and connections detached from the apparatus. The other figure shows all the parts in assembled relation. The invention comprises a trough 10, having an extension 12 which is adapted to admit the noses of the animals. One end of the trough has an aperture 13, in which a pipe 14 is arranged. A pipe 15 is suitably secured to the end of the



pipe 14 by a coupling *a*, and extends into a tank 16, the outer end of the pipe being preferably provided with a filter 17, and a valve support 13 is connected to the inner end of the pipe 14. A support 21 is pivoted to the valve support 13, and said pivoted support is provided with a valve stem 20 and a valve 19, said valve 19 being adapted to be seated on the outer end of the pipe 14. A float 24 is carried by the support 21, and is adapted to be actuated by the rise and fall of water within the trough, and thereby automatically regulate the water within the said trough, through the closing and opening of the valve 19. In the practical use of the invention, during cold weather manure, earth or other suitable material is placed around and over all of the trough excepting the extension 12 from which animals will drink. The dead air chamber 27 contiguous to said extension and in front of the partition 29 over which water flows from the trough into the extension, will materially aid in preventing water from freezing and closing communication between the trough and the extension.

Fuel Conveyer For Furnaces.

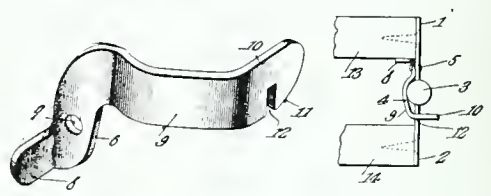
Among recent patents of merit, a device for automatically stoking a locomotive deserves mention. It is the invention of Edgar Anderson, of Alto Pass, Ill., and it has for its object to convey coal from the tender into the fire box of an engine, to distribute the same on the grate in a predetermined manner, and to provide means for cooling the conveyor after passing into the fire box. By reference to the drawing, it will be seen that the locomotive boiler is indicated by 10, the flue sheet by 11, the crown sheet by 12, the back fire box sheet by 13 and the back head by 14. The fire box has the numeral 15,



and 16 indicates the live grate and 17 the dead grate. The door 18 extends substantially across the width of the sheet 13. The ash pan 19 has an opening 20 commensurate with the opening 18 in the fire box. The conveyor itself comprises a plurality of endless link belts 20 running over sprockets, one of which, 21, is held in suitable brackets by the door. Within the fire box is mounted a sprocket 22, arranged to carry one of the chains. This sprocket is arranged so that the chain passing therethrough, together with the parts held thereon, will move downward through a suitable opening 23 in the dead grate and then around a sprocket 24, from which it is carried toward the tender over a sprocket 25 at the rear of the fire box. The tender 26 is provided with a tank 27, having a vertical front end 28. A supplemental tank 29 is held below the floor of the tender. A sprocket 30 receives the chain passing from sprocket 25, and a sprocket 31 is held in the supplemental tank to cause said chain to dip below the surface of the water. After leaving this last sprocket, the chain passes up parallel with the end sheet 28 of the tank, and over a sprocket 32, whence it returns to the sprocket 21. Any suitable motive power may be attached to one of the sprockets. In the device shown, a pair of chains is arranged on opposite sides of the fire box, and it is of course obvious that each chain will have its own series of sprockets oppositely disposed. Pivoted on rods extending from one of said chains to the other are tip buckets, each provided with a finger at the rear. These buckets are so arranged that there will be a number of sets, in each of which the fingers will have varying heights. Within the fire box is mounted a means for tipping said buckets, preferably comprising a bar 36, with downwardly extending fingers 37 arranged to lie in the path of the fingers on the bucket. These fingers are equal in number to the sets of bucktets, and serve to tip them. Similar fingers 38 are held within the tank 29, and replace the buckets after having been tipped. To hold the buckets in position to be loaded, bars are held on the chains and on these is mounted a cross bar with a sleeve provided with a hook. A spring is mounted on the bar to normally press the hook out of engagement with the bucket. To cause it to engage the bucket, ratchet bars are mounted in the tender adjacent the vertical path of the conveyor. Carried on the sleeve are a pair of resilient arms arranged to engage the ratchet bars, which causes the spring to be compressed and the hook to engage the bucket and hold it from tipping. In order to keep the coal from dropping into tank 29, a trap door 47 is arranged to move upward and permit the buckets to pass. Other trap doors, 48 and 49, are provided to transversely feed the coal. As the buckets pass up from the sprocket 31 they are loaded with coal, and as they pass into the fire box they are tipped, each one at the proper place to uniformly distribute the coal. They then pass out through the dead grate and over the sprocket 30, the buckets here being replaced in the right position, and they pass downward through the water, and so are cooled.

Blind Hinge.

An improved blind hinge has recently been patented by George W. Ellington, of Greensboro, N. C. The invention comprises a lock which will automatically engage a pair of pivoted hinge members and hold them in alinement, the engagement of the locking element upon the hinge members being capable of being operated without lifting or otherwise moving the hinge members themselves or either of them. Referring to the illustration, the invention comprises a pair of hinge members 1 and 2 respectively, which are pivotally connected at 3. A retaining member 4 is pivoted near one of its ends by a rivet 5 to the hinged member 1. This retaining member is shown upon a large scale in the figure to the right. It will be observed that a shank 6 is provided, having an aperture to receive the rivet 5. The lower terminal of the shank 6 is bent at right angles to form a support-engaging foot 8. The upper terminal of the shank 6 is laterally extended and bent backwardly, as denoted by the numeral 9, in order to pass around the pivotal connection 3 between the hinge members. The extremity 10 of the portion 9 is bent in a plane substantially parallel to the foot 8, and is beveled on the lower edge of its outer end 11, the said beveled portion terminating at a notch



12. When it is desired to swing the blind into a closed position, the retaining member may be lifted from its locked position by exerting slight upward pressure upon the beveled portion 11. It will be seen that in this operation the hinge itself is not disturbed, and further that there is no possibility of the blind being lifted from its seat. It will thus be seen that this invention dispenses with the lifting operation, which is necessary to blind hinges of the ordinary construction.

PATENTS

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LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

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H. F. BRAMMER MFG. CO. v. WITTE HARDWARE CO. et al.

(Circuit Court of Appeals, Eight Circuit. March 17, 1908 159 F. R. p. 726.)

1. PATENTS—INFRINGEMENT.

Plagman's patent, No. 608,220, August 2, 1898, for an improvement in mechanical movements, especially for use in washing machines, is not infringed by a machine constructed in accordance with the specification of patent No. 740,868, October 6, 1903, to Johnson.

A slidable cylinder is an essential mechanical element of each of the combinations claimed by Plagman, and it is absent from the machine of the defendants.

2. SAME — ABSENCE OF ONE ELEMENT OF COMBINATION AVOIDS INFRINGEMENT.

The absence from an alleged iufringing device of a single essential mechanical element of a patented combination is fatal to a claim of infringement.

BRUNSWICK-BALKE-COLLENDER CO. v. ROSATTO.

(Circuit Court, E. D. Pennsylvania. Feb. 21, 1908. 159 F. R. p. 729.)

1. PATENTS— CONSTRUCTION OF CLAIMS—REFERENCE LETTERS TO DRAWINGS.

The use in a claim of a patent of a letter of reference to the drawings which show a part composed of two pieces, does not limit the patentee to a two-piece construction where it is not of the essence of the invention claimed.

2. SAME—INVENTION—BOWLING ALLEY.

The Wiggins patent, No. 623,933, for a bowling alley having a concave side trough or gutter, discloses novelty, but is void for lack of invention, being merely for the substitution of one common form of construction for another, the function remaining the same, and the substituted form having previously been similarly and suggestively used in other structures, and without any extraordinary, even if of a fair, degree of merit.

3. SAME—RETURN RUNWAY.

The Wiggins patent, No. 554,611, for a ball runway for bowling alleys, is void for lack of patentable invention

LOVELL v. SEYBOLD MACH. CO.

(Circuit Court, S. D. New York. Jan. 10, 1908. 159 F. R. p. 736.)

1. PATENTS — INFRINGEMENT — BOOK-TRIMMING MACHINE.

The Lovell and Bredenberg patent, No. 490,877, for a book-trimming machine, was not anticipated and discloses invention, but is an improvement merely, and not a pioneer, and is entitled only to a narrow construction and a limited range of equivalents. The machine is designed and adapted to take books one by one and feed them to the trimming mechanism, to be operated on successively, and, in view of the limitations imposed on it by the prior art, is not infringed by a machine constructed to receive and trim a pile of books at a single operation, and which is also an improvement in a different line upon prior devices, and omits some of the means shown in the patent.

2. SAME.

The Lovell and Williamson patent, No. 734,907, for a book-trimming machine, claim 11, if conceded novelty and invention, is for a combination of old elements, and must be limited to substantially the means shown and described. As so construed, held not infringed.

COMMERCIAL ACETYLENE CO. v. AVERY PORTABLE LIGHTING CO.

(Circuit Court of Appeals, Seventh Circuit. Feb. 5, 1908. 159 F. R. p 935.)

INJUNCTION—SUBJECTS OF INJUNCTION—ENJOINING MULTIPLICITY OF SUITS FOR INFRINGEMENT OF PATENT.

Where the owner of a patent has brought suit against a rival manufacturer to enjoin infringement, and to recover profits and damages on account of the manufacture and sale of an alleged infringing device, in which suit both the validity of the patent and infringement are put in issne, the court has power on a proper showing to enjoin the complainant from instituting a multiplicity of suits in different parts of the country against customers of the defendant. who are charged with infringement solely by reason of the sale or use of the defendant's device, until the issues are determined in the principal suit before it.

WESTINGHOUSE et al. v. HIEN et al.

(Circuit Court of Appeals, Seventh Circuit. Oct 31, 1907. 159 F. R. p. 936.)

PATENTS—PROCEEDINGS TO OBTAIN PATENT EFFECT OF DECISION IN INTERFERENCE PROCEEDING.

Under the rules and practice of the Patent Office the decision of the examiner of interferences on a declared interference determines only the question of priority of invention in time as between the parties, and the party against whom the decision is rendered may still contend that there is no interference in fact or that the successful party is not entitled to the claims made, and he is not concluded upon the question of his right to a patent until the expiration of the time allowed him by statute for an appeal from the final order rejecting his application.

PENN ELECTRICAL & MFG. CO. v. CONROY.

CONROY v. PENN ELECTRICAL & MFG. CO. (two cases).

(Circuit Court of Appeals, Third Circuit. Feb. 7, 1908. 158 F. R. p. 943.)

PATENTS—PRIOR USE—WHAT CONSTITUTES "PUBLIC USE"—EXPERIMENTAL USE.

The use of a machine while it was being perfected, in a room from which the public and all others not engaged in its operation were excluded, changes and improvements being made from time to time, although extending back to more than two years before application was made for a patent, was an experimental and not a public use, and did not invalidate the patent granted therefor, and it is immaterial that the product of snch experimental use was sold.

NATIONAL WATER CO. v. O'CONNELL et al

(Circuit Court, E. D. Pennsylvania. Jan. 15, 1908. 159 F. R. p. 1001.)

TRADE-MARK AND TRADE-NAMES—UNFAIR COMPETITION—IMITATION OF LABELS.

Complainant, as proprietor of a spring from which it and its predecessors in business had for many years sold water throughout the United States and foreign countries under the name of "White Rock Lithia Water" in bottles having distinctive body and neck labels, held entitled to an injunction to restrain defendants from putting up and selling city water in competition under the name of "High Rock Lithia Water" in bottles similar to those of complainant, having body and neck labels of the same coloring and style of lettering, and so nearly resembling complainant's in general appearance as to be likely to deceive purchasers using ordinary care, and as to indicate beyond reasonable doubt to a person comparing them that the simulation was intentional.

CONSOLIDATED ENGINE STOP CO. v. LANDERS, FRARY & CLARK.

(Circuit Court of Appeals, Second Circuit. Feb. 11, 1908. 160 F. R. p. 79.)

1. PATENTS — INFRINGEMENT — THROTTLE VALVE.

The Stannard patent, No. 509,334, for an improvement in throttle valves, consisting of an electrically controlled emergency valve to shut of the steam passing to an engine, has as an element of each claim a steam passsageway to permit steam to pass into the chamber at one end of a balanced puppet valve, and is not infringed by the device of the Locke patent, No. 812,279, which has no such steamway nor its equivalent.

2. SAME—CONSTUCTION OF CLAIMS.

A patentee who has made a particular feature an element of his claims, although it may not have been essential to his invention, cannot claim that it is immaterial or that a device dispensing with it is an infringement.

BRADY BRASS CO. v. AJAX METAL CO.

(Circuit Court of Appeals, Third Circuit. Feb. 21, 1908. 160 F. R. p. 84.)

1. PATENTS — INVENTION — CHANGING PROPORTIONS IN ALLOY.

A mere difference in the proportions of the constituents of an alloy, however useful the result may be, does not entitle the originator to the monopoly of a patent, where such result was reached gradually by continued experimentation by the patentees and by others. all leading toward the same proportions, and the final product differs from those of the prior art only in degree.

2. SAME—ALLOY FOR JOURNAL BEARINGS.

The Hendrickson & Clamer patent, No. 655,402, for an alloy for antifriction bearings "consisting of less than seven per cent. of tin and more than twenty per cent. of lead and the balance copper," is void for lack of invention in view of the prior art.

CRIER v. INNES et al.

(Circuit Court, D. Vermont. January 30, 1908. 160 F. R. p. 103.)

1. PATENTS—INVENTION—DESIGNS.

The mere assembling of old parts to make a structure of a new design, although new lines and curves and a harmonious and novel whole are produced, does not involve invention so as to render the design patentable.

2. SAME—MONUMENT.

The Young design patent, No. 27,116, for a design for a sarcophagus monument, is void for lack of invention, the separate parts of the monument shown all being old in the art.

AMERICAN STEEL & WIRE CO. OF NEW JERSEY v. DENNING WIRE & FENCE CO.

(Circuit Court, N. D. Iowa, Cedar Rapids Division. March 2, 1908. 160 F. R. p. 108.)

1. PATENTS—SUBJECTS OF PATENTS—FUNCTION OF MACHINE.

The mere function or operation of a machine or other device as distinguished from the machine or device itself is not patentable.

2. SAME—SCOPE.

A patent cannot cover generally any and every means or method for producing a given resnlt.

3. SAME—CONSTRUCTION OF CLAIMS-RULES GOVERNING.

A patent is a contract, and the rules for the construction of contracts generally control in its interpretation and when its terms are plain, and the intention of the parties clearly manifest therefrom, they must prevail, but if its expressions are ambiguous or its validity or any claim is doubtful, that construction will be given which will sustain rather than to destroy the patent.

4. SAME—SUBJECTS OF PATENTS—NEW COMBINATION OF OLD ELEMENTS.

A new combination of old elements or devices, whereby a new and useful product is produced or an old product is obtained in a more efficient and economical way, may be protected by patent.

5. SAME — ANTICIPATION — MACHINE FOR MAKING WIRE FENCE.

The Bates patent, No. 577,639, for a machine for making fence of the woven wire or mesh type. is not invalid on the ground that its claims are for a mode of operation or principle or function of a machine, but is for the machine itself, designed to produce a certain described fabric, nor are the claims so broad as to include any and every machine for making this same fabric, nor was it anticipated by prior machines for making barbed wire or mesh fence fabric, but is for a new and novel combination, and discloses invention. Also held infringed.

6. SAME—"MECHANICAL EQUIVALENT."

The term "mechanical equivalent," as used in the law of patents, means that each of the ingredients comprising the invention covers every other ingredient which, in the same arrangements of the parts, will perform the same function, if that was well known for a proper substitute for the one described in the specification at the time of the patent.

AMERICAN STEEL & WIRE CO. OF NEW JERSEY v. DENNING WIRE & FENCE CO.

(Circuit Court, N. D. Iowa, Cedar Rapids Division. March 3, 1908. 160 F. R. p. 125.)

1. PATENTS—VALIDITY—MODE OF MAKING PATENTED ARTICLE.

The validity of a patent for a product or structure is not affected by the process or means by which it is made, or whether it is made by hand or by machinery.

2. SAME-INVENTION-WOVEN-WIRE FENCING

The Bates patent No. 561,193 for woven-wire fencing having parallel strand-wires and a series of single plain stay-wires connecting the strand-wires together by being coiled at their end portions around the strand-wires and intercoiled at their meeting ends. and in one form having the spaces between both the strand-wires and the stay-wires graduated so as to form graduated meshes, in view of the prior art is void for lack of invention

SMITH et al v. KRAUSE et al.

(Circuit Court, S. D. New York. March 11, 1908. 160 F. R. p. 270.)

TRADE-MARKS-SUBJECTS-NOVELTY RIBBONS

The words "Merrie Christmas" printed on or woven in ribbons at intervals are not the subject of a trade-mark, the words being an integral part of the ribbon, which was evidently designed for use in tying Christmas packages, and not merely a mark to identify the manufacturer.

NATIONAL REGULATOR CO. v. POWERS REGULATOR CO.

(Circuit Court of Appeals, Seventh Circuit. Feb. 7, 1908 160 F. R. p. 460.)

1. PATENTS—INVENTION.

The coupling, without modification, of a motor that will run any kind of a machine to a machine that will run with any kind of a motor, is not patentable invention.

2. SAME—HEATING AND VENTILATING APPARATUS.

The Powers patent, No. 558,610, for a heating and ventilating system wherein double dampers controlling separate ducts for hot and cold air are held in mixing position by a gradually acting thermostatically controlled motor, the purpose being to automatically regulate the temperature of the air discharged into a room through a single pipe, while for a new and useful combination, is void for lack of patentable invention, in view of the prior art, which disclosed the same motor and the same gradually acting damper, but not in combination.

HARDER et al. v. U. S. PILING CO.

(Circuit Court of Appeals, Seventh Circuit. Jan. 7, 1908. 160 F. R. p. 463.)

1. PATENTS — VALIDITY — FEATURES NOT CLAIMED.

A patent is not granted nor to be sustained by what the patentee may have done in fact, but only for what he particularly points out and distinctly claims.

3. SAME—INFRINGEMENT—SHEET PILING.

The Harder patent, No. 771,426, for a sectional sheet piling, construed, and in view of its limitations by the prior art held not infringed.

SCOTT v. LAZELL et al.

(Circuit Court of Appeals, Second Circuit. March 10, 1908. 160 F. R. p. 472.)

PATENTS — INFRINGEMENT — BUSTLE AND HIP-FORM.

The Scott patent, No. 792,158, for a combined bustle and hip-form, discloses invention, and is valid. Also held infringed as to claim 2.

SAFETY CAR HEATING & LIGHTING CO. v. CONSOLIDATED CAR HEATING COMPANY.

(Circuit Court, N. D. New York. March 26, 1908. 160 F. R. p. 476.)

PATENTS — INVENTION—CAR HEATING APPARATUS.

The Searle patent, No. 707,361, for a railway car heating apparatus, the essential feature of which embodied in the third claim is "in combination a water circulating system having a radiating portion in the descending pipe or upon one side thereof, and a second heater located below the first-named heater and at substantially the lowest point of the circuit," is void for lack of invention in view of the prior art, the location of a heater at the lowest point of the circuit being old, and the use of two heaters at different points being a mere aggregation of old parts which act independently and simultaneously without having any effect on each other or producing a new result.

2. SAME— CONSTRUCTION OF CLAIMS—INFRINGEMENT

Where an applicant for a patent contesting with others, and after repeated rejections in order to obtain a patent at all bases his claim thereto on a "peculiar organization" of parts, and specifies and specifically names and locates those several parts, he is held to the peculiar organization so particularized, specified, and claimed.

3. SAME—SUIT FOR INFRINGEMENT—LACHES.

A suit for infringement of a patent is barred by laches where the defendant, a rival manufacturer, commenced making, advertising, and selling substantially the same device as that alleged to infringe more than 10 years before the suit was brought and before the patent was issued, and continued the same up to the time of suit.

MECHANICAL INVENTIONS AND DESIGNS.

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Henning Petersen, Thief River Falls, Minn. Clamp or Grip.—This invention relates to means for gripping or clamping wires, cables and the like, and has for its object to provide an exceedingly simple article of manufacture that will constitute an effective clamp for guys, wire stretchers, hitching devices and the like, is readily applicable to the article to be clamped, and when in place and strain is applied thereto, will not slip and will not injure the article upon which it is clamped.

Charles F. Sawtell, Manchester, N. H. Fire Arm.—This invention has for its principal objects to provide a novel, efficient and exceedingly simple means for operatively connecting or associating a simple trigger with either controlling mechanism of a plurality of hammers, said means being located in convenient relation to permit its ready operation or change; and to provide a structure that is composed of a comparatively small number of parts and elements, which are not liable to become deranged or injured, certain of said parts or elements moreover performing double functions.

Frank W. Lum, Jefferson, Ohio. Stocking.—This invention has for its principal object to provide a simple and novel structure composed of separate foot and leg members that can be worn, laundried and interchanged as desired, and will always retain their shape so as to fit the foot properly, and cause no discomfort to the wearer, said members being connected together in a novel manner so that the stocking may be worn with perfect ease.

George H. Link, Cincinnati, Ohio. Switch Operating Mechanism.—This invention relates more especially to means for effecting the automatic operation of an electric switch at predetermined intervals, and is thus particularly useful in lighting and extinguishing electric lamps employed in the illumination of show windows and the like: and has for its principal object to provide a simple mechanism which is controlled by the time movement of an ordinary clock for effecting the periodic opening and closing of the switch, said mechanism being adjustable so that the period may be readily varied as desired to suit the conditions of service.

Arthur T. Ruthven, Topeka, Kans. Means for Releasing and Leading Animals from Stables.—The principal object is to provide novel means for automatically releasing and leading animals from stables in case the same catch fire, thereby materially reducing the danger of burning the animals, the operation being effected with ease and dispatch.

Ralph R. Lamb, Chicago, Illinois. Valve for Flush Tanks.—This invention has particular relation to float-operated valves or ball-cocks for flushing apparatus, and has for one of its objects to provide a valve mechanism of a novel and simple nature that is balanced by the pressure of water, so that no great power is necessary to operate the same, and such power can remain constant without regard to the degree of water pressure.

Francis J. Britton, Brainerd, Minn., inventor; Henry I. Cohen, same place, assignee one-half interest. Door Holding Clamp.—Doors, as they come from the factory, are ordinarily slightly larger than the door-ways for which they are intended, and therefore have to be trimmed or dressed down to the proper sizes. Considerable difficulty is experienced in holding the doors while marking them with the edges of the jambs as a guide. This invention has for its object to provide a simple and novel device, whereby doors of different thicknesses may be securely clamped to door frames of various thicknesses, and thus held in position during the marking or scribing operation.

Samuel A. Whitehouse, Kewanee, Ill., inventor; Western Tube Company, assignee, same place. Valve.—This invention relates to improvements in valves, and more particularly to an angle valve of that type which is characterized by an angular body or casing, the passage through which is controlled by a valve whose stem rises through the bonnet of the casing, and is operated by a suitable handle to open and close the valve. The object of the invention is to produce a quick acting valve having a self-packing non-rising stem, and capable of being manufactured at small cost and assembled with faculty and dispatch.

August Koy, Peters, Texas. Method of Protecting Vegetable Matter.—This invention relates to the protection of stored vegetable matter, particularly corn, from the ravages of insects, especially the weevil, and the object is to provide an effective method capable of being practiced during the storing of the corn or other vegetable matter, and serving to insure the complete protection thereof against the weevil or other insects for an indefinite period. This object is accomplished by covering the floor of the corn crib with wood ashes, then scattering wood ashes over the corn and finally sprinkling the whole with a solution of salt.

Benjamin W. Berry, Monticello, Fla., inventor; John H. Perkins, same place, assignee. Three patents.—The first patent covers a running gear for vehicles, constructed so as to permit either a pole or a pair of shafts to be coupled to a vehicle.

It is the aim of the second patent to provide for one-horse vehicles, a running gear adapted to dispense with the front hounds and their connections, and capable of firmly supporting the front of a wagon or other vehicle in a level position and of preventing the vehicle from tipping backward or forward.

The third patent relates to an axle provided with skeins, and equipped with strips located exteriorly of the said skeins and adapted to cushion the same and prevent it from being injured.

Olaf E. Lindfors, Fruita, Colorado. Fruit Picker. — The object of the present invention is to produce a picking device adapted to enable fruit to be picked with greater ease and rapidity than heretofore, and equipped with means for controlling the descent of fruit from a tree to a basket, or other receptacle, whereby the fruit is prevented from being bruised or otherwise injured. Another object of the invention is to provide an extensible fruit picker, adapted to be quickly varied in length, whereby fruit may be readily gathered from any portion of a tree. A further object of the invention is to provide cutting mechanism for severing the stems of the fruit, and operating means for the cutting mechanism capable of changing the position of the same to render it more effective.

William Polis, McVille, N. D. Beltless and Chainless Drive for Grain Elevators.—As the title indicates, the object of this invention is to dispense with belts and chains and enable grain elevators to be operated with a minimum amount of labor, and to provide operating means which will not be affected by the wind, and which may be readily started by hand should the elevator become clogged.

William H. Etter, Marietta, Ohio. Four patents. Weather Strips.—The first patent covers a hinged weather strip, capable of automatic operation to swing downward and close the space or crack at the bottom of the door when the same is shut, and adapted to swing upward clear of the carpet or other floor covering when the door is opened. Another object of the invention is to provide a weather strip capable of adjustment to fit the sill or floor as closely as desired, and to be the proper distance above the floor in the opening movement of the door, and the angle of which be changed.

It is the aim of the invention of the second patent to produce a weather strip, designed for use on both doors and windows for excluding the air, and adapted to conform to any irregularities of a door or window. A further object of the invention is to provide a weather strip, adapted to be applied to a fixed portion of a door or window casing, and capable of firmly clamping a door or window when the same is closed.

The third patent relates to a combined guide and weather strip, adapted to be readily applied to windows by inexperienced persons with the simplest of tools, and capable of effectually excluding the air without interfering with the removability of the sashes, and of preventing side motion of the sashes, thereby correcting ill-fitting sashes. Another object of the invention is to prevent sashes from rattling and to reduce the friction to a minimum and to enable the sashes to slide freely at all times.

The invention of the fourth patent has for its object to provide a combined weather strip and guide, designed primarily for use on windows at the top, bottom and sides thereof, and capable of being advantageously employed as a guide for any two relatively movable parts. Another object of the invention is to produce a weather strip equipped with a resilient tongue, composed of independently adjustable flanges or members, adapted to create light friction and to form practically an air tight joint or connection, which will not bind or become inoperative through any accumulation of dirt or lint. A further object of the invention is to construct the resilient tongue so that it will be automatically straightened through the movement of the parts, should it become bent from any cause.

Austin W. Bunch, Spring Hill, Tenn. Clothes Pin.— An object of this invention is to enable an efficient clothes pin to be constructed of a single piece of wire, adapted to be readily applied to and removed from a clothes line, and of being left thereon as occasion may require. Another object of the invention is to have engaging portions capable of securely clamping a garment or other fabric on a clothes line.

Christopher Switzer and Frederick Sundman, Doe Run, Mo. Two patents. —The first patent relates to a combined railway cattle guard and metallic cross tie, adapted to strengthen a track and afford passage-ways or conduits for water to permit the same to flow readily across the track without impairing the latter. Another object of the invention is to provide a device of this character having cattle guard members, capable of effectually preventing cattle from crossing the track, and arranged to brace the rails at the outer sides thereof to prevent the same from spreading.

An object of the invention covered by the second patent is to provide a guard rail clamp, having means for securely locking a guard rail in position to prevent the same from either lifting or rolling outward, whereby the percentage of wrecks resulting from inefficient guard rails will be reduced to a minimum.

John W. Pettijohn, Montesano, Wash. Three patents.—The first patent covers a latch, designed particularly for use on large farm gates, chicken houses, granary bins, and other out-buildings, and adapted to afford a grip or handle to enable a gate or door to be readily opened and closed, and equipped with a movable locking member or bolt, which will be protected from the weather and prevented from being operated by a horse, or other animal.

The second patent relates to a latch adapted for use on sliding and swinging doors and gates, which may be applied to either right or left hand doors and gates, and which will not be rendered ineffective or inoperative by any sagging of a door or gate. Another object is to provide a latch having a hasp member, adapted to receive a padlock, and capable, when disengaged from the keeper of the latch, of being arranged out of the way so that any object carried through the door or gate-way will not come in contact with the hasp member.

An object of the invention of the third patent is to provide an undercut saw guide, adapted to afford a firm support for a cross cut saw, capable of being readily driven into, and removed from, a log without injury to the guide. Another object of the invention is to provide a saw guide, which may be adjusted more rapidly than heretofore, and which, when not in use, may be compactly folded so as to be conveniently carried in the pocket from one place to another.

Fleming C. Rawley, Dublin, Ky. Fence Post.—An object of this invention is to provide a fence post, equipped with means for clamping a plurality of fence wires, adapted to afford a firm support for the same, and capable of enabling fences to be erected and taken down with great rapidity. Another object of the invention is to provide a practically indestructible fence post base, which will not be subjected to decay, and around which the ground may be easily and tightly packed, whereby the fence post will be securely anchored in the earth and effectually prevented from becoming loose.

James Sinisi, New York City, New York, has recently been granted Letters-Patent for an improved typewriting machine, and has assigned the same to the Cosmopolitan Addressing Co., of the same place.—The invention relates more particularly to means for producing stencil cards employed in addressing machines, though there are features not necessarily limited to such use. The primary object of the invention is to provide novel means of a simple nature which may be rapidly and conveniently operated, and which will properly present the cards and hold them in position with respect to the printing or perforating mechanism. A further object is to provide a machine, wherein the keys and operating means are on the order of the standard type-writing machine, so that they can be operated by any one having a knowledge of such machines. A still further object is to provide mechanism for feeding cards to the machine, the card-holding means co-acting with the feeding means so that the cards can be successfully positioned with respect to the printing point with speed and accuracy.

William A. Gibson, Laboma, Okla. Combined Level and Plumb.—This invention has for its object to provide a combined level and plumb, designed for use as an inclinometer and equipped with indicating mechanism, adapted to be readily trued-up, removed and replaced.

NEW PATENTS FOR SALE.

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FOR SALE—Patent No. 923,153, dated June 1, 1909. Window Guard. Great money maker. Want correspondence with honest men and manufacturers to place window guards on the market. Sell part cash and royalty. Write for a copy of the patent. Max R. Dennhardt, Box 802, Honesdale, Pa. oct

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FOR SALE—Patent No. 919,083. Money holder for mail boxes, patented April 20, 1909. A tin device which can be cheaply manufactured. Will sell outright or by states. Address, Frank Spenner, Route 1, Stayton, Oregon. oct

FOR SALE—I have a valuable patent for sale. The best of its kind. Will sell outright for a reasonable price if sold quickly. The said patent is an improvement in trace carriers. For particulars. Address, S. M. Wold, Box 303, Estevan, Sask., Canada. oct

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FOR SALE or Partner—Patent No. 891,739, dated June 23, 1908. Skirt supporter for holding up ladies skirts while walking or crossing muddy streets. Have dies ready for manufacture. Will sell for cash or easy terms or take good partner. Can get manufactured very cheaply. Address, Walter W. Schwotzer, Rodfield, Pa. oct

FOR SALE—Patent No. 920,685. Requires only one-tenth as much oil as other wheels. Axles run in oil. No waste, no friction. Can manufacture as cheaply as common wheels. A money maker. Will sell outright or half interest. Address, J. S. Strawn, Avonmore, Pa. oct

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FOR SALE—U. S. Patent No. 916,363, patented March 23, 1909. A new and useful improvement in swinging gates. Gate can be opened and closed from a wagon, without even stopping the draft animal. Desire to sell outright, at once. Address Robert M. Olson, Box 205, Iron River, Michigan. sep

FOR SALE—Patent No. 916,322, dated March 23, 1909. Fence Construction. Includes concrete base and corrugated galvanized iron post with corner brace for wire fence. Address, S. R. Johnson, Winston, Missouri. sep

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FOR SALE—Patent No. 901,917, outright. A very valuable and useful crib made of wood. Can be manufactured very cheaply. Address, Theodore Kreisel, Warrenton, Va. dec

FOR SALE—Patent No. 913.125, dated Feb. 23, 1909. Picture Hanger. Can be manufactured at twelve cents each, and sold for thirty-five cents. Good reasons for selling. Can be adjusted in a moment. Address, Mrs. Feefee Green, Custer, Montana. sep

FOR SALE—Patent No. 901,124, dated Oct. 13, 1908. Air agitating device for valve-bearing solutions, or any solution requiring constant agitation. For full particulars address, Thomas A. Ross, Selby, Contra Costa Co., Cal. nov 09

FOR SALE—Patent No. 914,241, issued March 2, 1909. A two horse road working machine. Simple, practical and easily manufactured. Will sell outright or by territory or royalty. Address, A. C. Callendar, Port Gibson, Miss. aug

FOR SALE—A money maker in nut lock. Will sell cheap for cash. Patent No. 912,499. Must be sold to meet payments and will sell at once. All letters given prompt attention, Address, W. H. Snavely, R. F. D. No. 2, Spring Mills, Pa. aug

FOR SALE—Patent No. 912,152. Fire Escape. An invention of remarkable merit and one which will have large sales. Price reasonable. For full particulars, address P. Nigro, Clarksville, Tenn. aug

FOR SALE or partner wanted—Two good new patents, one U. S. and one in Canada, on wire supported brooms. Best made. Owing to advanced age and physical infirmity will sell cheap. Address, William Fanckboner, 123 Ruby Street, Houghton, Mich. aug

FOR SALE—Patent No. 885,460. A Rural Mail Box. Its sides differently colored. Will revolve either to right or left. Stands firmly in different positions. Its different colors and different positions answer all signals. Address, S. J. Felknor, Route 3, Morristown, Tenn. aug

FOR SALE— U. S. Patent No. 913,723, dated March 2, 1909. "The Handy Stanchion." Secures or releases the full row of cattle (or part of row) instantly. A simple, safe, perfect and cheap device. Address, Royal Grafton, Mount Charles, Ont., Canada. aug

FOR SALE—Patent No. 876,264, dated January 7, 1908. Measuring Instrument. A combination level, plumb and inclinometer. Gives the length and bevel of rafters, and intended to be fitted with a telescope and mounted on a tripod for surveying railroad grades, canals, etc. Address, Ira E. Burley, Highwood, Montana. aug

FOR SALE—Patent No. 831,427. Device for suspending mosquito netting or canopies. For use either in private families or hospitals. Possesses wonderful cooling capacity. Prevents mosquitoes from getting near the sleeper or patient. Quick buyer will procure a bargain. For terms and other information address, J. B. R. Noble, No. 72 Summers Avenue, Washington. Pa. sep. 09

WANTED.

WANTED—A manufacturer to make and put on the market on royalty the best patented combination padlock ever invented. Address, James N. Mills, 401 Flowers Ave., Pittsburg, Pa.

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WANTED—We are open to consider anything good in vending machines or real live small novelties. Address, The Automatic Vending Co. Limited, London, Canada. sep

WANTED—A company to buy or manufacture on royalty, patent No. 911,484. Guitar and banjo, both in one. Best instrument on the market. Address, Irvin Fillman, Hastings, Oklahoma. aug

WANTED — Good mechanic wanted to take half interest in Remer rotary engine. Patent No. 610,085. None but mechanics need apply. Address, Frederick W. Remer, 310 D Ave., Lawton, Okla. aug

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The Value of Foreign Patents.

Every attorney knows that there is a great deal of money wasted in foreign patents. Some inventions are hardly worth a United States patent, and it is folly to incur the expense of foreign protection as well. Before applying for foreign patents, it is always best to ascertain something of the industrial conditions that prevail abroad, and decide upon foreign protection only after careful investigation. If, however, one has a really useful invention, and desires to test the validity of his patent in some striking manner, although he may not desire foreign protection, there is no better method than to apply for patents in such countries as England, Germany, Austria, Sweden and Norway, where examinations as to novelty are made. Especially is this true of the German Patent Office, in which the examination covers about the same field as that in the United States Patent Office. In England, only English patents are examined, by virtue of a provision of the law. In Germany, Austria, Norway and Sweden, the examinations cover all patents of the word, and one can get a fairly accurate idea as to the value of his grant, after it has passed through the patent offices mentioned. We have in mind an improvement in toys, on which the United States Patent Office allowed some very broad claims, although the examination was supposed to include the patents granted in a large number of countries. Before the issue of the United States patent the applicant decided to apply for protection in Germany and Austria, because he knew that the best and cheapest manufacturers of toys were located in those countries. To his surprise, the German and Austrian offices discovered English and German patents closely approximating his invention, and practically nullifying many of the broad claims of the United States patent.

In another instance, the patentee of a lubricator made up his mind, upon the issue of his grant, to sue a certain concern for infringement. Fortunately, before the issue, he made application for foreign patents in a number of countries. In both Germany and Austria patents were developed which substantially anticipated his invention, showing clearly that the United States patent was void. In the above cases, the United States Patent Office had made mistakes in its examinations. In the last mentioned one, if the patentee had not applied for protection abroad, but had immediately sued the infringing company, there is practically no doubt that he would have been defeated in his action, and would probably have lost several thousand dollars. It may be presumed that the counsel for the infringing company would have discovered the references which the United States Office had missed in its examination, and which were brought to light by the German and Austrian officials.

While the instances above related came under our personal observation, we have heard of others of a similar character, which leads us to conclude that there is no better test of the validity of a United States patent than to make application in a number of foreign countries. After a case has been brought to the attention of the patent offices of Europe and nothing has been found to anticipate it, a patentee may well feel that he has an invention worthy of the name.

To err is human, and these errors in the examinations of the United States Patent Office may be expected to happen. They should not occur as often as they do, and it is possible that in the future they will be less frequent; but it is much better for an inventor to spend from three to five hundred dollars in foreign patents in countries where examinations are made as to novelty, than to spend from three to five thousand dollars in an infringement suit, with doubtful results. If we were interested in a really valuable invention, we would not be satisfied until we had tested its validity by applying for patents in England, Germany and Austria. It is obvious that three or four examinations by officials in different countries are much more likely to develop any anticipating patents than the single examination in this country. It is customary for a purchaser of a patent to have the records of the United States Office searched, to determine the validity of the patent, and in this examination foreign patents are included. If a United States patentee could show by the protection of English, German and Austrian patents that his claims had gone through these different offices without restriction or limitation, what better test of validity could be furnished?

As we stated above, it amounts to almost a criminal waste of money to apply for patents abroad on many of the inventions protected by the United States Office, but for the purpose that we have described, no wiser expenditure could be made. It prevents trouble, quiets apprehension, and allows the United States patentee to feel that he has an invention of merit and one that will probably stand the test of an infringement suit.

A Nation of Law Breakers.

Nothing better was ever said than was contained in the address of James J. Hill, the western railway magnate, in discussing the larger problems of American civilization, economic, industrial, educational and social. He pointed out the defects in the civic system with unsparing criticism, and the reforms which he believed must prevail to avert a shipwreck. Our laws, he said, were too complicated, and as a remedy he suggested: "Get the laws fully tried. Weed out those that are improper and impracticable, curtail the contempt of law that flourishes under the system of non-enforcement, and make the people understand that government means exact and unsparing justice instead of a complex game. That is the only safeguard, if respect for and confidence in the government are not to be undermined."

Mr. Hill probably did not have the patent laws in mind, but his comments apply with as much force to them as to others. Our patent laws are already complex, and yet we go on adding new provisions, which tend to still further confuse the system. The conditions prevailing in foreign countries with respect to the administration of the patent laws are in striking contrast to those obtaining here. With few exceptions—and the United States comes under this category—every civilized country in the world makes the infringement of a patent a criminal offense, and the government stands back of the patent and sees that the rights of the owner are enforced. The grant of a patent is regarded in Germany as such a sacred thing, that a German manufacturer when threatened with an infringement suit makes every effort to clear himself from the charge. We know of a case where a German attorney notified a manufacturer of typewriters in that country, that the use of a particular name was regarded as an infringement of the rights of a United States manufacturer who had taken out trademark and patent protection in Germany. What did he do when notified? Did he turn the matter over to his attorney and tell him to defeat the patent? By no means. He took the first train to Berlin, saw the attorney who had sent him the notice, and the affair was settled by the German manufacturer ceasing to use the name. A manufacturer in this country, when he gets notice of infringement, either pigeon holes it or turns it over to his attorney for investigation. The attorney tries to find a patent anticipating the one alleged to be infringed. Even if he reports that the case is likely to be sustained in the United States courts, the manufacturer thinks that by fighting the patentee he may be able to wear him out, and have the patent declared invalid on some technical ground. There is almost a universal demand among patentees in this country that the government shall stand behind a patent. Not that he shall deprive the patentee of his civil remedy, but that he shall have something more than a claim for damages or profits. If infringement were made a criminal offense in this country, punishable by fine or imprisonment, or both, more value would attach to the issuance of patents. Naturally the United States Office would be more careful in issuing them, and fewer patents would be granted, but both of these results would be advantageous. The infringement of a United States patent is now regarded as a negligible matter. No one accepts the issue of a United States patent as anything more than a *prima facie* presumption of validity. The patentee does not know that he has a valid grant until the courts have so declared. An infringing manufacturer will not accept a patent as a valid one until it has been held so by the court of last resort. After a patentee has spent from three to five thousand dollars in carrying his case through the courts, he may get a decree that the patent is valid, but the infringer in the meantime may either have gone out of business or so flooded the market with goods as to practically destroy it for years to come. Damages or profits gained from the judgment may be so small as to be hardly worth fighting for before the master of the court.

Some measures should be taken to increase the value of a patent and make an infringement a serious matter. It is a species of contempt of law that causes the infringing manufacturer to look upon his act as a matter of no consequence. The infringer nowadays knows that he has a chance of having the patent declared invalid, and even if the judgment is rendered against him, the expenses will be so great as to deter the patentee from carrying the matter beyond the decree of the court granting the injunction. If he knew, however, that the United States Government was behind the patentee, and instead of a civil suit for damages or profits a criminal action could be instituted, the infringement of a patent would be regarded as a grave offense. Not until some such means are adopted, will the patentee in this country get what he is justly entitled to. He should obtain protection, and the present laws, disregarded as they are by the infringing public, do not give him all that he needs.

The Transformation of Waste Substances.

Every possible substance that we use and throw away comes back to us, sooner or later, transformed into a a new and different material. So complete are the disguises that we do not recognize our old friends and servants; and so far has this process been carried that it will not be long before such a thing as a waste substance will be unknown. It is chemistry that has unlocked for the world the gates of this new and interesting realm. The biography of a piece of soap would cast into the shade the vivid imaginings of the most active muckraker. The scrapings of kitchen sinks, the refuse grease that is thrown into the garbage can, are carefully collected by human scavengers, and sold to a fat-rendering establishment

to be made into soap. In the manufacture of this article there are formed waste liquors out of which it is possible to make glycerine. Glycerine is made into dynamite. Dynamite is used to blast coal and other minerals. Coal produces illuminating gas, and one of the by-products of this gas is ammonia. From ammonia we get caustic soda, and caustic soda is largely used in the manufacture of soap—which brings us back again to the beginning of our cycle. And this is only one of the many circles of rehabilitations that are going on all about us. As already indicated, soap cast upon the waters will return after many days; but so will woolens, ink, paper and a host of other articles. It would make my Lady Dainty shudder to realize that she laves her face with the product of the refuse dump; that the artificial pearls on her neck were made from the fish scales which her cook threw into the garbage pail six months before; that the wine jelly she eats might be distilled from old boots; and that her dresses may have once been the cast-off rags of a beggar. No one can swear that he has not worn the same coat twice. Old clothes containing wool are carbonized, or in other words, they are treated with chemicals which reduce the cotton in them to dust, which can be blown out, leaving the wool fibers, which are again made up as new cloth. This process may be repeated endlessly; for if the time comes whenever the overworked wool fibers give out, they are made into fertilizer which is spread upon meadows to grow grass for sheep to eat, so that brand new wool may be produced. Old shoes, in the same way, are made into fertilizer which helps to grow grass for cattle to eat, thus causing the production of leather for new shoes. Even our pet animals come back, in other forms, to haunt us. Fine gloves are made from the skin of the lapdog, and mastiff leather is generally used for riding gloves. There is no end to the list of useful articles that can be made from the horse, ranging from the mattresses on which we sleep to the candles that light our rooms at night. As to the cat, the employment of the skins for fur linings of cloaks, etc. is too widely known to need comment. Nor is the rat found wanting. His skin is used in the manufacture of men's "silk" hats, and also for gloves.

Sawdust is one of the most versatile of products. Gas, acetic acid, tar, oils, charcoal, dinner plates (compressed), explosives, wood alcohol, and brandy, are a few of the things that the chemists extract from this formerly negligable substance. From the tar alone comes benzine, zymol, paraffin, naphthalene, and the hydrocarbons used in making aniline colors. One enterprising scientist has even succeeded in making a breakfast food from sawdust, and it is reported to have been palatable. If we drink wine, the lees in the bottom of the bottles will return in the form of cream of tartar, to be used in raising cake and bread, or as tartar mordant, with which clothes are dyed, or as tartaric acid, employed in effervescent salts. One use begets another in this progressive employment of waste materials, and many an industry has been transformed because of the new values that have been set upon by-products.

Wireless on the Lakes.

Wireless telephony will soon work a revolution in the methods of handling the shipping of the Great Lakes. At scores of points along the coast the towering poles of the wireless telephone system, each with its antennae of wires, have been constructed, and the system will shortly be in use from end to end of the chain of America's inland seas. By the use of this system marine insurance rates will be reduced a minimum, owing to the fact that all storm warnings may be transmitted immediately to lake vessels, so that they will have ample time to make safe harbors. Used in conjunction with the existing land systems, it will make it possible for persons hundreds of miles from the lakes to talk with passengers on the ships.

Few people realize the enormous interests represented in the commerce on the Great Lakes. Thirty thousand craft of all classes are engaged in the trade, lake shipyards are several years behind in their orders, and steamship companies have been obliged to go to England and Scotland for boats. The freight carried over these waters last year was more than seven times as much as passed through the Suez Canal. The boats of the Steel Trust alone have a combined capacity of 650,000 tons of ore on a single trip. In weight of freight handled Duluth and Buffalo are the world's greatest ports, while the tonnage handled at Ohio ports alone exceeds that of all the ports of France.

Greatest of all lines of lake traffic is that in iron ore; 800 giant steamers are engaged solely in its carriage. This ore trade has doubled during the last six years, and the steel men believe it will be doubled again during the next ten, for three little patches of the Great Lakes country produced last year nearly half of the world's total supply of iron ore. Grain and flour to the extent of hundreds of millions of bushels were shipped from lake ports, and the lumber shipments aggregated 1,500,000,000 feet. Coal and flax seed are also important articles of trade. Everywhere the shipping is crowded, in many places dangerously so. The greatest ocean ports have never known such blockades as Duluth has seen on more than one occasion. Steamers pass through the Detroit River on an average of one every 12 minutes, night and day. The average of arrivals and clearances mounts up to 40 a day. Harbors will have to be enlarged to accommodate the growing traffic, and unless some means is employed for the safe guarding of this vast shipping, the tragedies of the next decade will be greater than all those of the past. In the wireless telephone it is believed a large measure of protection has been found. Terrible wrecks have occured in these water ways. During one week of last October a round dozen ships, each valued approximately at half a million dollars, were lost. Collisions are also growing in number. Scarcely a day passes without the news of some such disaster. All these dangers can be averted by the use of wireless.

Within a short time, vessels will be able to pass from the Great Lakes down the Mississippi to the Gulf, via the ship canal which Chicago is building. The future of lake commerce is something so vast that few would venture a prophecy. Of all the needs of the trade, there is none so vital as reliable means of communication between ships and the shore. Work has been rushed on the wireless stations, and the system will soon be in full operation.

Uses of Aluminum.

Aluminum, once a rare and costly metal, is today, bulk for bulk, one of the cheapest and most common. It is obtained by electrolysis from a kind of clay called bauxite, and is cast in molds and drawn into tubes, wires, etc., by methods resembling those employed for copper. The sheets are welded together by means of electricity, or joints are made by the portable oxy-acetylene blow pipes.

The uses of aluminum are so varied and are growing so steadily, that it would be difficult to enumerate them. The metal every day finds its way into new channels. Next to gold, it is the most malleable of all metals. It is also capable of retaining a very high polish. As a conductor of electric current, its properties are highly appreciated. The saving that can be effected by using it instead of copper for overhead wires is so large that in countries where long transmission lines are in vogue, the lighter metal is practically supreme. Aluminum powder is used largely in the manufacture of metallic paints and varnishes. Thin aluminum foil is employed for packing and wrapping purposes, in place of lead and tin. Pure aluminum tubes find application in many directions. In connection with textile machinery, there is also a large field for the metal in making rollers, bobbins and other moving parts. The utility of aluminum cooking utensils is widely recognized. It is used for many purposes in building motor cars, where stiffness combined with lightness is desired. It is also finding a sphere in the work of brass founders, engineers, etc. Powdered aluminum mixed with ammonium nitrate forms a powerful explosive, which has the advantage of being harmless except when fired by a detonator. In the form of a coarser powder, it is a valuable adjunct to the work of steel makers. The efficacy of small quantities of the metal in preventing porosity is well known. Porosity is caused by the partial disengagement of gases absorbed during melting, which are imprisoned as the metal cools. Aluminum combines chemically with these gases and produces a harmless slag. The combustion of aluminum and oxygen produces the most intense heat known to science, and this is employed in welding iron and steel castings. The metal is also used in iron and steel works for removing the oxygen from oxides of iron, and many other substances with which it comes in contact. A number of valuable alloys are made from aluminum.

Testing Milk by Electricity.

One of the most important duties which boards of health perform in large cities, is the testing of milk. The dangers surrounding the use of impure milk are notorious, and these are caused no less by the disease germs in the milk, due to careless handling, than by the malicious adulteration of this important item of our daily food.

The testing of milk was quite an elaborate affair, until electricity was applied to this work. The test to determine the amount of fat requires the employment of ether, which must be heated to the evaporation point. As ether is a very explosive material—more so even than gasoline—it requires very careful handling. Gas cannot be employed for this purpose, and the use of steam he requires constant attention on the part of the operator. The problem has been solved in New York City, says *Popular Electricity*, by the use of specially constructed electric stoves, each 3½ inches in diameter and consuming but 60 watts. These stoves give a somewhat low but absolutely uniform heat, which point is of great importance in tbe tests.

When the milk inspectors have seized samples from dealers, they are taken to the laboratories of the department of health to be tested. A small roll of filter paper is carefully weighed and then immersed in a sample of milk. After it has absorbed all it will hold, it is taken out and again weighed, so that the chemist knows just what quantity of milk he is testing. The paper is then placed in a test tube, located in a glass flask over the electric stove. Ether is put into the flask, and the current is turned on. As the ether heats to the boiling point its vapor goes up through a chamber, through which cold water passes, and is condensed again in to ether, which drops onto the milk soaked paper. When the inner test tube is filled, an automatic device permits it to flow back into the flask, taking a certain percentage of the fat, which is extracted from the milk. The operation must be repeated seventeen times within the space of one hour. It must be done neither too fast nor too slow, or the test is imperfect; that is the reason why only an electric stove will properly perform the work. The electric stove is designed to produce a given amount of heat, and so perfectly does it perform this work that no attention is required by the chemist in charge, other than to see that the switch is turned off at the expiration of just one hour from the time the test was begun.

A CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE. This keeps inventors and manufacturers posted in the art in which they are most interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy; twenty copies $1.50.—Please give correct data in ordering.—Address,

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Crushing-rolls.....A. E. Hogue
Cuff and sleeve protector, Elastic.....W. H. Emmert
Cuff-blanks, &c., Machine for infolding the edges of.....G. J. Dormandy
Culinary device for preparing omelet, &c.....H. R. French
Cultivator attachment.....W. N. Thornton
Cupola.....N. F. Wilshire
Currycombs, brushes, &c., Attachment for.....J. S. Sourek
Curtain-fixture, Swinging.....C. F. Sullivan
Curtain-rod.....L. C. Lazear
Curtain-rod, Car-window.....C. O. Birney
Cushioning device.....F. O. Kilgore
Cuspidor.....H. E. Weber
Cuspidor and rubbish-receptacle, Combined.....N. A. Pennoyer
Cutter-head.....J. R. Keene
Dam.....N. L. Hall
Dam and building the same..D. E. Moran et al
Damper-regulator, Automatic.....N. C. Locke
Dental appliance.....B. Dysart
Deposit and collection receptacle..H. P. Turner
Desiccating apparatus.....O. Paucksch
Desiccating apparatus.....J. Mecredy et al
Desk and seat, Combined school..A. G. Cox
Desk, Folding.....J. Spoljar
Detergent compound.....A. Kayser
Dichlorethylene, Making....P. Askenasy et al
Dish-carrier.....H. T. and A. D. Blake
Disinfector and lamp, Combined.B. F. Corwin
Disk-cleaner.....W. H. Gay
Display apparatus.....I. J. Owen
Display device, Garment-.....W. Mehler
Display-figures, Artificial limb for..L. Wulkan
Display stand, Necktie-.....W. A. Swann
Display and cooling cabinet, Vegetable.....J. D. Rush
Distributer for pulverized substances.....S. W. Farnham
Door-holt.....F. Loev
Door-fastener.....S. J. Saphier
Door fastener, Sliding-.....J. Cloos
Door-frame, Adjustable.....M. M. Moen
Door-lock.....G. A. Huber
Douche or bed-pan.....I. Schikorra
Draft appliance, Spring-.....D. R. Davis
Draft attachment and evener.....W. Barto
Draft-gear and coupling.....B. Banyay
Draft mechanism.....C. E. Estabrook
Drag, Road-.....D. C. Boyd
Dredger for pulverulent material.C. B. Nesbitt
Drier.....F. Foster
Drier.....J. Judelson
Drier.....D. B. Plunkett
Drill-socket.....C. A. Simmons
Drilling-machines, Automatic feed-stop device for.....A. W. Wigglesworth
Drinking-glasses, Sanitary mouthpiece for.....F. E. Blenckstone
Drum and cymbal beater.....E. M. Anderson
Dust-pan attachment.....C. W. Grobe
Dye and making same, Red vat.....G. Engi
Dye, Azo, 2 pats.....J. Jansen et al
Eccentric, Adjustable.....L. Bauroth
Elastic webbing.....S. Kops (Reissue)
Elbow-pattern, Adjustable...D. W. McDonald
Electric currents, Means for controlling the supply of.....G. Henry
Electric cut-out.....T. E. Murray
Electric furnace.....L. D. Farnsworth et al
Electrical rosette.....C. D. Platt
Electrically-controlled lock....A. Armel et al
Electrode, Cylindrical positive.E. O. Schneider
Electrodeposition, Forming designs by.....F. A. Walter
Electrolier and reflector therefor.....W. H. Spencer
Electrolier-switch.....C. Tomschik
Elevator-gate-operating mechanism.....G. H. Johnson
Embossing and printing press..C. E. Brooks
Engine-indicators, Reducing-motion for.....S. T. Danks
Engines, Electric igniting device for reversible internal-combustion.....C. W. Askling
Envelop.....W. H. Mullins
Envelop, Cop-.....F. Moss
Envelop-opening machine.....G. Metske
Equalizing mechanism.....C. P. Hidden
Extension-table, Pedestal.....O. G. Franks
Eyeglass-guard.....J. S. Galeski
Eyeglass-mounts, Guard-plate and bearing-pad for.....W. G. Fay
Eyeglass-protector for base-ball players, &e....R. J. Hellawell
Fabrics, Apparatus for impregnating and extracting liquids from.....H. Hey
Fan, Electric.....F. Diehl et al
Fan, Suction-.....W. E. and J. H. Watson
Fastener, Safety-.....G. F. Powell
Feed and litter carrier.....H. L. Ferris
Feed-bag.....A. Kovacs et al
Feed-crusher.....J. L. Gibson
Feed-cup.....J. M. Pierce
Feed, System of boiler-.....T. R. Brown
Feeding device for horses, Street.....V. A. Croshier
Feeding mechanism.....C. von Philp
Fence-post.....A. W. Sprague
Fence stretcher, Wire-.....J. C. Hewitt
Fence stretchers, Grip for wire-...J. C. Hewitt
Fertilizer-distributer.....O. Lewis
Fibrous material, Flexible.....G. Lanzendorfer
File, Bill-.....M. Herbst
Filter.....C. R. Perry et al
Filter-press.....S. K. Behrend
Finishing-machine....W. B. C. Hershey et al
Fire-boat.....W. I. Babcock
Fire-escape.....W. P. Slattery
Fire-extinguisher.....A. C. Badger
Fire-extinguisher-bottle closure..S. L. Wottring
Fire-kindling compound and making same....W. Geneslaw
Fires in mines, Extinguishing.....F. T. Byers
Firearm.....P. Mauser
Firearms, Light-projecting attachment for.....H. A. Foss
Floor-covering joint.....J. I. Howard
Flue or tube expander.....J. W. Faessler
Fluids, Intimately mixing liquid and gaseous..P. Kestner
Flying-machine, Aeroplane.....A. Beriozzi
Folding box.....C. E. Wrenshall
Folding box.....G. M. Slack
Folding chair.....J. Spoljar
Folding-machine.....W. W. and W. L. Dixon
Food composition...O. L. M. Abramowski et al
Force-feed lubricator.....H. W. Haneoek
Form for ladies' waists, &c., Packing.....E. F. Simmons
Frame-joint.....E. G. Budd
Fruit-evaporator.....C. O. Lee
Fuel-feeder.....A. Manuel
Furnace.....F. V. Knauss

Furniture, Take-down article of..J. M. Horton
Fuse case, Electric.....T. E. Murray
Game apparatus.....G. H. Grounds
Game apparatus.....A. A. Lehr
Game apparatus.....R. Carter
Garbage disposal apparatus.....A. E. Dumas
Garment-marking device.....E. Werner
Garment, Union.....W. A. Meredith
Gas-burner.....G. Smith
Gas generator, Acetylene-.H. B. Compton et al
Gas-making apparatus, Air-heating device for.. A. H. Blackburn
Gas-mantle attachment, Incandescent..... M. Herskovitz
Gas-meter.....R. L. Dezendorf
Gas-producer connections, Cleaning out apparatus for.....R. H. Miller
Gases and separation of air into commercial oxygen and nitrogen, Liquefaction of..... G. A. Bobrick
Gases, Apparatus for liquefaction of..... G. A. Bobrick
Gate.....A. B. Pickett
Gate.....S. A. D. Heston
Governor.....K. Johansen
Governor, Explosive-engine pressure..... A. Winton
Grate.....R. D. Granger
Grinding composition.....E. B. Gallaher
Grinding-mill.....T. L. and T. J. Sturtevant
Gripping device.....E. Kan
Gum, Extraction of.....P. C. D. Castle
Gun-sight protector.....W. Langstroth
Guns, Cartouche charge for.....A. Wratzke
Hair-tonic.....A. P. Riggs
Hair-tonic.....E. Kearney
Hame-fastener.....H. H. Deming
Hammer, Electric-power.....W. Scribner
Hammer, Pneumatic.....H. A. Brockway
Hand-bag.....L. Merzbach
Harrow.....F. Hosford
Harrow.....L. F. Wheeless
Hat-body and making the same.B. Wollner et al
Hat-container, Lady's.....F. Young
Hats, Means for facilitating the circulation of air under.....L. Morigl
Hay rake and cocker.....W. C. Trussell
Hay rake and loader.....C. Bornholdt
Headache, Appliance for relief of..... J. M. Blashfield
Headlight-operating means.....E. C. King
Heater.....F. Buehring
Heating air or other gases, Apparatus for.... W. R. Wood
Heating and mixing plant.....F. O. Blake
Heating furnace, Continuous-...H. E. Smythe
Heating medium for scientific and similar apparatus, Means for automatically regulating the supply of.....G. S. Edelen
Heating system, Duplex.....E. H. Gold
Hinge.....C. F. Anderson
Hinge, Gate or door.....C. W. Cook
Hinge, Spring-.....E. Bommer
Hoe and weeder, Garden.....J. S. Worcester
Hoisting and conveying apparatus.W. M. Shaw
Hoisting or carrying mechanism for barns.... M. S. Yoder
Horseshoe.....M. T. Keenan
Horseshoe calk-plate.....O. F. Peterson
Horseshoe-calk, Removable.....D. A. Shaffer
Hose-coupling.....R. S. MacEwan
Hosiery, Manufacture of fashioned.....A. Gee
Hub, Vehicle-.....W. R. Wilson
Hunting-knife.....D. H. Holman
Hydrant, Hose-.....C. C. Corlew
Hydrocarbon-burner.....N. C. Stamps et al
Hydrocarbon-motor.....F. L. Nichols
Hydropneumatic wheel.....H. Oudinot et al
Ignition-regulator, Automatic...E. D. Waldron
Implement-handle, Auxiliary....C. P. Paulsen
Internal-combustion engine.....W. E. Struss
Internal-combustion engine.....R. A. Reynolds
Invalid-lifter, swing, and wheel-chair combined C. F. Moore
Iron-heater.....F. L. Miller
Jacquard mechanism.....J. A. Groebli
Jar-cover.....W. Strachan et al
Joint coupling, Universal-.....F. Panse
Joint device, Expansion-.....F. Seiffert
Keyhole-guard.....R. J. Copeland
Knit fabric having elastic selvages.H. C. Shaw
Knockdown box.....A. M. Wight
Label-affixing device, Bottle-.....S. B. Goff
Labeling machine, Can-.....J. Barrow
Ladder, Extensible.....A. F. Cralle
Lamp.....M. I. Cohen
Lamp and lantern.....H. E. Harbaugh
Lamp bracket, Vehicle-.....J. L. Eblen et al
Lamp-bulb guard.....G. L. Brisbin
Lamp, Inverted incandescent gas-.J. W. Hosler
Lamp-oscillator.....G. Printup
Latch-bolt dogging mechanism.....A. Arens
Lavatory.....W. Bunting, Jr.
Lawn-sprinkler.....B. F. Wooding
Leer-charging apparatus...W. E. Hubbell et al
Level, Automatic.....J. J. Garrett
Life-saving device.....F. C. Bargar
Light-fixture shade.....P. J. Handel
Line-easting machine, 2 pats.....J. R. Rogers
Line-easting machine.....L. L. Kennedy
Line-holder.....C. W. Wilson
Liquid heating and cooling apparatus..A. Jensen
Liquid-purifying apparatus.....F. P. Smith
Liquid-separator, Automatic.....O. Zerkowitz
Liquids and gases chemically active upon each other, Apparatus for simultaneously treating J. Steynis
Lithographic presses, Blanket for..... F. A. Tessmer
Loader.....R. A. Ogle
Lock.....R. Feola
Lock and latch, Combination.W. T. Blount, Jr.
Locking device, Drawer and tray..... W. H. P. Feely
Loom.....W. R. Burrows
Loom.....W. J. Garlick
Loom-side protector.....O. C. Goulet et al
Loom thin-place preventer.....J. T. Rutledge
Lubricating-washer.....C. E. Palmer
Lubricator.....J. Sherry
Mail-bag catching and delivering mechanism.. W. C. Miller
Mail-box.....H. P. Davis
Mail-carrying apparatus.....L. W. Wescott
Mail delivering and receiving apparatus..... W. Kreanner
Mail delivering and receiving apparatus..... W. O. Massie
Mail-receptacle.....J. W. Cutler
Match-box.....P. J. Wurzburger
Match-box and cigar-cutter, Combined..... W. H. Webster
Match-safe.....S. Whitcomb
Measuring and weighing machine.B. P. Mulloy
Measuring apparatus, Torsion-.W. H. Kenerson
Mechanical movement.....W. S. Taylor, Jr.
Medicine-cabinet.....J. W. Hunt
Merry go-round.....B. F. Fitch
Metal-cutting apparatus.....N. H. Davis
Metals by the wet method, Electric dissociation of.....A. Levy
Meter statement-delivery apparatus..... R. W. Gallagher
Micrometer.....A. Nielsen
Milking-machine.....L. Holt
Mill and method for rolling tubes.M. F. Capron
Mining-timber, Reinforced concrete..... J. A. Elliott
Mold.....L. D. Irish
Molding apparatus.....J. H. Danver et al
Molding-machine.....R. C. Meyers
Mortising tool or chisel.....O. L. Smith
Motion, Mechanism for converting reciprocating into rotary.....O. Schoell
Motor control, Electric-.....D. C. Jackson
Motors, Apparatus for injecting fuel into internal-combustion.....F. Dürr
Mower cutter, Lawn-.....A. B. Case
Mud-guard.....B. L. Jones
Muffin-pan.....H. R. Wolfer
Music-leaf turner.....J. F. Dickson
Musical instrument, Brass.....J. Löw
Nail-setter.....C. A. Gehne
Needle-shower.....I. G. Dimond
Nest-trap.....G. H. Gaw
Nut-lock.....T. M. Mills
Nut-lock.....B. Humphrey
Oar.....H. Chaussinand
Oil-burner.....H. H. Ashlock
Oil-burner, Self-cleaning.....P. K. Morcom
Oil-cup.....W. L. Morris
Oiling device, Belt-.....C. Benson
Ore-jigger.....W. M. Williams
Ore-separator.....C. M. Mullen
Ores, Reducing.....F. M. Becket
Overalls.....J. Stecker
Oxygen from air, Separating..G. M. A. Claude
Package.....T. D. Richardson
Package-tie.....D. Comfort
Package-tie.....J. Bennor
Packing.....C. C. Puffer
Packing, Lubricating-.....M. L. Stewart et al
Paper bottle-closures, Making....C. F. Jenkins
Paper-box-blank-cutting machine....F. Giroud
Paper boxes and similar articles, Closure for.. P. B. Myers
Paper-machine.....H. J. Meader
Paper, &c., Machine for mounting sheets of.. E. Jagenberg
Papering apparatus.....O. O. Carey
Papering-machine.....D. Krapf
Pea huller and separating machine..... M. T. Freeman
Pencil-case and other cylinder....A. Walker
Phonograph-record cabinet....W. C. Nickerson
Phonograph-stop.....F. H. Andrews
Photographic apparatus.....H. Hübscher
Piano-action.....L. N. Soper
Piano fall-board.....J. R. A. Lang
Piling, Interlocking sheet-metal.....S. T. Fiero
Pilings, Device to protect.....A. B. Cook
Pipe-connector, Automatic, 2 pats..J. L. Mohun
Pipe-coupling.....T. W. Moll
Pipe-coupling.....V. H. Kriegshaber
Pipe-fitting.....G. Clark
Pipe-reamer.....W. F. Porter
Piston for ammonia-compressors..P. Neff et al
Pitcher.....D. Ball
Planer, Metal-.....H. Baerbalck
Planter and fertilizer-distributer, Combined.... H. Tatum
Planter, Cotton-.....C. A. Thurmond
Plate-lifter.....I. E. Spry
Pliers.....J. Irwin
Plow.....G. G. Floyd
Plow.....A. L. Covey
Plow.....T. Parks et al
Plow.....A. C. Rosencranz
Pocket-holder for pens, pencils, or like articles J. H. Cowan
Pocket, Safety-.....C. D. Trussell
Pocket, Safety-.....M. Pugatsky et al
Poke, Animal-.....M. E. and L. C. Baker
Polishing implement.....H. J. Miller
Polishing-wheel.....H. E. Moineau
Post-card stand.....M. E. Bishop
Potato-seed cutter.....J. Snyder
Press attachment, Drop-.....A. O. Slentz
Press for the manufacture of tubes, rods, and the like from blanks.....A. Schwieger
Pressure-button.....V. Marendowski
Printing-frame.....C. Dow
Printing-machine.....J. A. Boyce
Printing-press.....G. Hartman
Propeller-shafts, &c., Transmission-gear for.... P. Daimler
Pump for automobiles, Power air-..... W. J. Spencer
Pump governor, Automatic steam-..... C. P. McMullen
Pump, Steam-.....T. R. Brown
Pump, Vacuum-.....J. T. Wilkin
Punch, Check-.....G. Sittmann
Putty-knife, Automatic.....J. H. Johnson
Rack.....F. P. Shek
Rail connection.....W. A. Hendricks
Rail sand, Track-.....J. Taylor
Rail-straightening device.....J. Warehock
Railway, Automobile scenic.....A. G. Neville
Railway-gate.....R. Spurlock
Railway-rail joint.....P. McGinley
Railway-signal, Electric.....W. A. D. Short
Railway-signal-operating device..A. S. Hickley
Railway-switch.....G. J. Abry
Railway-switch.....W. A. Guynn
Railway-switch-operating mechanism, 3 pats.... J. P. Blackwood
Railway-tie.....E. S. and C. G. Michael
Railway-tie.....A. Morrison
Railway-tie and fastener.....H. A. Bamberger
Railway-tie and rail-fastener.L. E. Barton, Sr.
Railway-tie puller.....J. R. Smith
Railway-track sweeper.....S. Speer
Railway-traction.....G. Giorgi
Ratchet mechanism.....W. A. Peck
Ratchet-wrench.....S. A. Brockway
Receptacle.....O. J. Weeks
Receptacle-closure.....E. P. Ryburg et al
Reflectograph.....M. Monaco
Refrigerating cars, Means for....L. M. Lyon
Relay.....E. McClintock
Resin-like product, New.....C. Gentsch
Retort.....L. Augustin
Revolver-frame clamp.....J. H. Wesson
Ring or loop.....R. J. Nicholson
Riveting-machine.....W. H. Kennedy
Road-surface preparation or composition..... W. A. and S. C. Meadows
Roadways, Manufacture of bituminous..... C. Richardson
Robe holder, Lap-.....C. B. Phillips
Rock-drill.....H. J. Hibschle
Roller.....B. D. Turner
Roller.....A. Stouffer
Rolling machine, Metal-form-...W. D. Eynon
Roof.....T. Kress
Roof-covering, Metal.....F. A. Clark
Rotary engine.....C. Miller
Rotary engine.....T. Jorgensen
Rotary shears.....F. E. Liebig et al
Rubber or caoutchouc, Preparation or regeneration of.....F. W. Passmore
Sad-iron, Gas-heated.....C. F. Capell
Sand-band.....H. G. Peters
Sander-head.....G. A. Lippincott
Sash-fastener.....F. R. Kratzenberg
Saw-filing device.....R. E. Blankenhurg
Saw guide, Adjustable band-.F. T. McDonough
Scene and curtain trimming and hoisting apparatus.....C. S. Harding et al
School register, Sunday-.....C. Bernst
Scraper, Foot-.....T. C. Prouty
Screw.....O. Rehse
Screw-press mechanisms, quick return for.... A. W. Williams
Scrubbing-machine.....A. F. Fischer
Seal, Car-.....H. I. Lahr
Seat-frame.....E. G. Budd
Seeder.....J. Hitchings
Semaphore-controller..T. F. McAndrews et al
Separating process, Electrostatic..... L. I. Blake et al
Separation of solids from liquids.H. T. Durant
Separator.....R. W. Jessup
Separator feed-governor, Centrifugal-..... J. J. Berrigan
Sewing-machine.....J. E. Miller
Sewing-machine.....J. S. Johnston et al
Sewing-machine attachment.....M. J. Eidam
Sewing machine, Book-.....C. J. Rich
Sewing-machine guide attachment....R. Frank
Sewing machine, Shoe-..... J. H. and J. B. Ursbruck
Sewing-machine spool-holder.....F. C. Luethy
Shade adjuster, Window-....A. N. Fries et al
Shade and curtain-pole hanger.J. A. McCaskey
Shade and socket holder, 2 pats..... W. F. Minor et al
Shade, Window-.....C. M. Martin
Shafts and the like, Sinking....D. E. Moran
Shelf or stretcher fastener for knockdown tables, &c.....W. J. Maddox
Shock-absorber.....H. Muehlhausen, Jr. et al
Shocking apparatus.....M. Kelly
Shoe, Laced.....M. Kroell
Shoulder-brace and garment-supporter, Combined.....I. M. Bond
Shuttle.....J. H. Morin
Sieve-hanger.....A. P. Troxell
Sign.....R. P. Schriver
Sign apparatus, Motor-operated.....C. Beile
Signal.....D. B. Utt
Signal-controlling device, Electromagnetic.... E. B. Craft
Signaling system, Wireless-, 2 pats.G. Marconi
Siphon.....E. Neugebauer
Skid and truck, Combination..E. W. Skipworth
Skirt-marker.....R. Sideman
Skirt-supporter and waist-holder....J. Sprague
Slack-adjuster, Automatic.....C. O. Anderson
Small-arm breech mechanism.....K. J. Ebert
Smoker's pipe.....P. Talarico
Snap-switch, Rotary.....G. W. Goodridge
Soap receptacle, Liquid-, 2 pats..E. E. Ellmann
Solder-edged caps, Forming....C. W. Graham
Soldering-machine.....C. W. Graham
Soldering-stick.....L. R. Benson
Soldering-tool.....E. L. Seaman
Sound-reproducing machine.....L. T. Haile
Speed-controller, Automatic.....C. E. Palmer
Spinning-machine traveler, Ring-..... V. D'Aoust et al
Spittoon, Fountain-.....A. C. Clark
Spraying apparatus.....A. Sala
Spring-fastening.....K. and M. Gerisch
Spring-wheel.....R. H. Burgess
Stack-former.....C. A. Hitchcock
Stacker, Hay-.....J. H. Cope
Steam-jetting device.....E. A. Wildt
Stoker for locomotive-boilers, Mechanical..... J. H. Lowe
Stone press, Artificial-.....J. Draenert
Stopple-puller.....E. Sanborn
Storm-shield.....A. L. Brown
Stove, furnace, and the like.....H. Gerdes
Stove, Gas-.....M. O'Brien
Strength-testing apparatus.....J. L. Perkins
Strength-testing machine.....C. W. Putnam
Stress-indicator.....W. P. Chapman
Striking-bag platform, Portable.P. G. Armitage
Stropping device.....J. Schnurr
Suction apparatus, Hydraulic air and other gas W. J. Frame
Surgical head-holder.....S. M. Langworthy
Swing.....W. Johnson
Tack puller, Insole-.....L. G. Freeman
Tank-float.....F. M. Stevens
Telautograph.....G. S. Tiffany
Telegraphic receiving-tape.....P. B. Delany
Telegraphy, Wireless, 2 pats..R. A. Fessenden
Telephone attachment.....R. E. Pedigo
Telephone-cables, Distributing-terminal for.... F. J. Beaucond
Telephone-exchange system....J. L. McQuarrie
Telephone-ringer.....J. A. Birsfield
Telephone-transmitter mouthpiece..... M. S. Hufschmidt
Telephone-transmitters, Antiseptic attachments for.....E. B. Crosby
Telescopes, Focusing-cap for.....H. C. Mustin
Tempering-furnace, Electric.....V. Royle
Thermometer bulb-protector.....A. Roesch
Thermoplastic compound and making same.... B. B. Goldsmith
Thermostat-controller.....J. McCartin
Thionous precipitation.....G. C. Westby
Thread-cutting tool.....B. Borden
Tie, track-fastener, and brace...J. J. Griffin
Tightening device.....H. English
Tile greenhouse-bench.....B. P. Wise
Tile-machine.....H. H. Gibson
Tire-casing, 4 pats.....J. F. Palmer
Tire for vehicles, Removable...A. M. Condit
Tire, Metallic.....G. E. Fortescue
Tire-plug.....R. Sampson
Tire, Pneumatic.....F. H. Perry
Tire, Pneumatic.....J. F. Palmer
Tobacco box and cutter, Combined.H. C. Moses
Tobacco-pipe.....G. D. W. Schmidt
Tobacco, Treating.....F. S. Smith
Tongue, Wagon-.....F. A. and N. C. Long
Tool, Electropneumatic.....W. Z. Ward
Tools, Making hand-.....G. E. Wood
Train-stopping device.....J. E. Maloney et al
Transportation-receptacle for dead human bodies C. L. Barnes
Trolley-hanger.....W. H. Kempton
Truck, Elevating-.....W. H. Caldwell
Truck, Hand-.....A. W. Young
Trunk.....S. W. Bonsall
Tubes, Apparatus for automatically perforating C. Thibodeau
Turbine.....G. H. Cook
Turbine.....W. L. R. Emmet
Turbine, Elastic-fluid.....C. Roth
Turbine, Steam-.....A. Bonom
Type for type-writing machines, &c., Machine for making dies for the manufacture of.... L. A. Diss
Type-making machine.....W. G. Reynolds
Type-setting and line-casting machine..... H. Degener
Type-writer line-spacing mechanism..... F. H. Ward
Type-writing machine.F. X. Wagner (Reissue)
Type-writing machine.....W. J. Roche
Type-writing machine.....H. Crutchley
Type-writing machine.....G. A. Seib
Type-writing machine.....J. C. McLaughlin
Type-writing machine.....J. Sinisi
Type-writing machine.....J. F. Allard
Type-writing machine.....G. H. Smith
Type-writing machine.....E. E. Strong
Type-writing machine.....C. Gibbs et al
Type-writing-machine erasing device..... G. K. Andrews
Umbrella.....J. Beaudry
Valve.....R. L. Breth et al
Valve.....C. Wilson
Valve apparatus for tanks....L. A. Cornelius
Valve, Automatic shut-off.....C. D. Miller
Valve-controlling device, Hygrometric..... W. S. Johnson
Valve device.....M. Garl
Valve for water-tanks.....E. A. Naslund
Valve-gear.....M. Berg
Valve, High-speed-reducing.....W. V. Turner
Valve-locking device.....E. A. Brandenberg
Valve-seat-refacing device.....R. Netter
Valve, Throttle-.....C. C. Kindig et al
Valve, Water-supply.....H. Gardenier
Vanner.....G. B. Shipley
Vehicle-wheel.....F. Bradley et al
Vehicle-wheel.....J. R. Fouch
Vehicle-wheel.....L. A. Hill
Vehicle-wheel, Cushioned.....W. C. McCarty
Vending-machine, Coin-controlled..... R. F. Emmerich
Vending-machine, Coin-operated...C. M. Linde
Vending-machine ejecting device..J. E. Allison
Veneer-press.....W. R. Snyder
Ventilator.....G. G. Loehler
Vessels charged with volatile liquids or liquids under pressure, Closure for.S. Paulard et al
Wagon-body lifter.....W. P. Lucas
Wagon, Dumping-.....J. D. Bunn
Washboard.....D. Hughes
Washboard soap-holder.....R. E. Toy
Washpan.....P. Schlueter
Washing-machine.....G. A. Post
Washing-machine.....J. H. Pearson
Washing-machine gearing.....H. W. Darrow
Water-elevator.....H. Z. Hoylman
Water-gage.....H. R. Fay
Water-heater.....W. A. Pratt
Water-meter.....P. A. McGurrin
Water-motor.....W. J. White
Water-motor, Impact.....R. M. Doble
Water-supply apparatus.....T. Smith
Water-wheel-bucket attachment..W. R. Eckart
Wave-motor.....C. E. Edwards
Weather-strip for doors.....B. E. Cox
Weed-cutter.....J. J. Smith
Weed destroyer and gatherer.....B. Promije
Weighing apparatus for liquids, Automatic.. J. P. Baldwin
Weighing-machine.....W. S. Scales
Welts, Material for waterproof.J. R. Reynolds
Wheat, Machine for separating cockle from.. C. P. Ballard
Wheelbarrow.....A. N. Faulkner
Whiffletree-fender.....E. N. Smith
Windmill.....E. Hards
Window-balcony.....J. P. Roger
Window-fixture.....T. J. Corken
Window-screen.....W. H. Millis
Window-ventilator.....C. O. Meurk
Wire-connector.....L. C. Callahan et al
Wire-stretcher.....F. Davis
Woodworking-machine.....D. S. Courtney
Woodworking-machines, Rotary cutter for.... C. Karpp
Work-holding means.....E. W. Morehouse
Wrench.....W. E. Piper
Wrench.....J. G. Paterson
Wrench.....H. T. Bush
Wrench.....L. Forsythe
Writing-machine.....E. B. Hess

DESIGNS.

Badge.....J. Sullivan
Bottle-stopper.....W. Horlick, Jr.
Desk standard, School-.....W. B. Cogger
Doll-pattern.....A. Z. Baker
Emblem.....A. L. Manahan
Grille.....H. O. Schmidt
Lamp reflector, Arc-.....M. J. Wohl et al
Lamp-shade.....J. Kappler
Lamp shell, Arc-.....M. J. Wohl et al
Mirrors, brushes, or similar articles, Back for J. R. Dean
Refrigerator.....M. Rose
Refrigerator ice-chamber door.....M. Rose

Refrigerator provision-chamber door..M. Rose
Shoe-clasp.....F. Di Gioia
Sign.....W. C. Henderson
Spoons, forks, or similar articles, Handle for.. F. Habensack
Surgical dressings, Fibrous sheet-material for.. W. M. Stone
Vending-machine casing.....A. P. Watt
Wall-register.....G. S. Auer

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Adding-machine stand..A. Hendricks (Reissue)
Advertising-vehicle.....R. C. Hahnke
Aeroplane.....J. H. Rogers
Air-brake appliance, Automatic..... J. A. and L. F. Couch
Air compressor or blower..... G. W. and W. H. Leiman
Air or other fluids, Compressor or exhauster for.....C. H. Scott
Ammonia and chlorin or hydrochloric acid.... N. L. G. Whitehouse
Amusement device for producing illusory effects N. Burgess
Anchor and bolt, Expansion.....T. Mason
Angle-irons, Machine for bending...C. Gabriel
Antislipping device.....M. F. Stowe
Autographic register.....A. Krauth
Automobile lubricating system..... A. Winton et al
Automohile starting device..J. R. McPherson
Automobiles, Electric gear-changing mechanism for.....F. Beemer
Awning.....A. F. Winberg
Awning.....H. F. Sanders
Ax-handle protector.....A. H. Gruis
Axle, Car-.....G. Haigh
Bag-holder.....J. A. Nungesser
Bailing-machine.....W. M. Kinnard
Balance.....W. Heusser
Ball-field marker, Base-.....T. H. Murnane
Ball-mill.....E. Cadenaccio
Barrel.....O. R. Emmrich
Barrel-filler.....H. W. Colhy
Barrow.....W. Paton
Base-ball.....B. F. Shibe
Battery connection.....O. E. Pettee
Battery-filling machine.....C. J. Coleman
Beaded line.....J. F. Shiel
Bearing, Ball-.....H. Hess
Bearing, Ball-.....R. S. Phillips et al
Bearing, Combined step and journal..A. Dehne
Bedstead, Extension-.....H. B. Arnold
Beer from storage vessels by the direct influence of air-pressure of variable strength, Device for raising and conveying..... J. H. W. Ortmann et al
Bell, Fluid-operated.....F. C. Hansen
Belt-pin.....J. C. and J. A. Doran
Billiard-table.....I. Fuld
Binding device.....E. Neumeister
Binding sheet-music, Device for...A. F. Engel
Block-signal system.....F. Rhea
Blotter-holder.....A. I. Cole
Bobbin-holder.....C. H. Curfew et al
Boiler-scale, Preventing the formation of..... T. Brázda
Book, Invoice or scrap.....A. C. Hafely
Books, &c., Adjustable Support for..C. E. Buck
Boot and shoe beading tool....C. W. Roberts
Boot and shoe uppers, Welting and lasting.... T. F. Littleton
Bottle.....C. O. Smith
Box.....P. H. Kractsch
Box-board.....H. L. Beveridge
Box-lid support.....N. H. Nielsen
Brake.....J. F. Cummings
Brake-actuating mechanism, Vehicle-..... G. E. Kidd
Brake-shoe.....C. D. Pettis
Brake system, Automatic..W. U. G. Shaw et al
Breast-strap and neck-strap connection..... E. J. Hoffman
Brewery pitching-machine apparatus..... E. Moxham
Brick-kiln.....W. Gibford
Brick-machine.....S. E. Drummond
Brick, Making.....O. S. Davis
Broom.....H. R. Stevenson
Brush.....H. V. Hardman
Brush-holder.....E. W. Mix
Brush, Rotary tooth-.....A. Meng
Bucket, Clam-shell.....J. B. H. Ouchterlony
Bucket, Clam-shell.....H. L. Allen
Bucket-filling machine.....J. Riddell
Bucket-operating mechanism.....H. L. Allen
Bucket-wheel.....C. M. Schultz
Buckle, Cross-line.....L. Cook
Butter measurer and cutter....D. F. Curtin
Button-fastener.....H. A. Mabhey
Button-making machine.....R. B. Cochrane
Button, Separable.....E. C. Kaag
Cabinet, Disk-record.....T. H. Sentell
Cable-connector.....H. W. Cheney
Calculating-machine.....J. D. Hayes
Calendar tear-off tablet.....A. Biberfeld
Can-closure.....G. Lauterback
Candle-protector, Miner's.....W. Cooper
Cane and the like.....W. Bimblich
Capstan-screw.....W. C. Vogel et al
Car and other berth section, Railway-sleeping-.. H. Pearson
Car-brake.....J. A. Davis et al
Car center sill, Railway-.....I. G. Downs
Car-coupling.....O. A. Berkhouse
Car-door hanger.....P. M. Elliott
Car-door lock, Automatic burglar-proof..... H. L. App et al
Car door or gate, Railway-....L. A. Sherman
Car-door securer, Brake-controlled.F. J. Gilroy
Car, Dump-.....L. P. Gaston
Car, Dumping-.....J. L. Blaker
Car-lighting system.....S. Krohn
Car-seat.....H. Witte et al
Car, Semi-convertible.....E. T. Robinson
Car-wheel and making the same....J. Slattery
Car-wheel and making the same, 2 pats..... F. E. Canda
Car-wheels, Abrading-shoe for truing up..... J. M. Griffin
Car-window.....E. A. Haitinger
Cars, Automatic locking and releasing device for mining.....J. H. Stroope
Carbureter.....J. B. Knickerbocker
Carousel.....E. T. Vangezell
Carpenter's tool.....G. W. Hodgin
Carriage and sleigh, Convertible baby..... A. J. Adams
Carriage or perambulator, Baby-...A. J. Adams
Carton.....N. J. Goodman
Casing and marking gage.....W. A. Banfill
Caster-attaching bearing-box....V. C. Luppert
Casting apparatus.....E. B. Van Wagner
Casting metals, Manufacture of molds for.... E. L. Bohl
Catamenial appliance.....D. S. Daudt
Centrifugal extractor....H. S. Wilcox et al
Chain-link or chain.....T. J. Williams
Chandelier-support, Hollow-chain.L. P. Dickey
Channeling-machine.....W. B. Butler
Check-lock.....C. W. Cropp
Check, Recoil-.....F. J. Mellen et al
Churn.....C. S. McCalman
Churn-operating mechanism.....F. N. Johnson
Cigar cutter and perforator.....H. C. Cragg
Cigar-lighter.....A. C. Gruhlke
Circuit-breaker.....H. W. Cheney
Cistern.....G. Ross
Clamp-attaching device.....J. P. Lyon
Cloth-cutting machine.....S. Hardy
Clothes-line holder.....H. B. Shreve
Clothes-line reel.....E. W. Powers
Clothes-rack, Folding.....L. W. Addison et al
Clutch, Friction-.....G. W. Starr
Clutch-shoe.....R. M. Sellers
Coaster-brake, Back-pedaling, 2 pats..... F. S. Ellett
Coat-shirt.....G. Becker
Cock or faucet.....J. D. McClelland, Jr.
Cock or faucet.....J. W. Barry
Cock, Railway-car angle-.....L. A. Hoerr
Cock, Safety-.....J. Winkler
Cockeye.....M. R. Vikla
Coffin.....J. Donahue
Coin-controlled device.....W. H. Steiger
Coke-oven-watering apparatus.....D. B. Stauft
Coking plant.....W. R. Elliott
Collar fastener, Coat-.....C. E. Graves
Collator.....A. F. Harris et al
Color-box.....E. E. Wilson
Composing mechanism, Multiplex.W. Bancroft
Compressors, Automatic drain for..... W. D. Mount
Computer.....C. A. Pitkin
Concrete construction and producing the same G. A. M. Liljencrantz
Concrete-construction form.....J. Carr
Concrete-fence-post-forming apparatus..... J. W. Millam
Condenser.....A. R. Everest
Condiment-holder.....A. J. Bennett
Conduit, Flexible.....O. Hoppe
Contact, Electric sliding or other..... V. Löwendahl
Contact-shoe, Third-rail.....R. R. Potter
Control system.....H. D. James
Coring machine, Tomato-.....W. G. Lumsden
Cork, Manufacturing artificial....B. Honowsky
Cot and tent, Combined portable folding..... I. A. Walker
Cotton-chopper.....W. Shy et al
Cotton-gin.....F. T. Kent
Couch and sofa, Combined....T. F. Gullikson
Crane, Horn-.....J. H. B. Conger
Crate, Folding.....J. Woods
Cross-head.....F. O. Ball
Cross-tie and rail-fastener, Metallic..... H. D. Phillips
Cultivator.....H. Lucier
Culvert.....M. F. and O. Parks
Current regulator, Constant-.....A. A. Tirrill
Curtain-fixture.....C. L. Hopkins
Curtain-fixture.....O. Datter
Curtain-fixture.....H. E. Keeler
Curtain-pole.....C. B. Rimmel
Curtain-stretcher.....C. Miller
Curtain-stretcher.....J. D. Mason
Davenport.....M. L. Brilliant
Delivery apparatus.....E. Hallam
Detachable roller and bracket for same..... A. Kaufman
Detergent.....A. Kayser
Developer, Daylight.....A. Hamburger et al
Die-stock, Elastic.....T. A. Cain
Die-stock, Geared.....H. W. Oster
Dies, Adjusting device for cutting-..... G. H. Haslop
Display-box, Sheet-metal.....F. Westerbeck
Display-rack.....J. W. Moon
Door check, Swing-.....H. L. Hess
Door, Folding.....E. H. McCloud
Door-hanger.....F. O. Hanson
Door-hanger.....G. L. Schnepf
Door-mat.....C. D. Bonner
Dough handing up or rolling machine..... W. Scott et al
Draft appliance.....H. W. Smith
Draft-bar for farm machinery...F. W. Kloke
Draft-rigging mechanism.....G. H. Forsyth
Drain-wheel.....R. H. Martin
Draw-plates, Machine for polishing diamond.. E. Schmidmer
Drawers and suspensory, Combination..... E. A. Melze
Drawing instrument.....D. S. Clark
Drawing-press.....W. Klocke
Dredge.....J. Carlésimo
Dresser.....F. O. Anderson
Drill-brace.....J. Gessert
Drilling-machine attachment..... C. E. Sprague et al
Dry-room hanger, 2 pats....W. Bartholomew
Dust-guard.....A. E. Smith
Easel.....A. Schrickerling
Electric apparatus, Vapor.....E. Weintraub
Electric-circuit protective device..... J. B. Taylor et al
Electric fluid-heater.....C. C. Chesney et al
Electric interlock system, Automatic..... J. F. Clark
Electric-light-button-turning device.A. R. Hurst
Electric lights, Slack take-up for pendant.... J. Maitland
Electric machine, Alternating-current dynamo- D. C. Jackson
Electric machine, Dynamo-.....H. G. Reist
Electric machine, Dynamo-.....J. B. Wiard
Electric machine, Dynamo-....B. A. Behrend
Electric machines, Core-spacing member for dynamo.....B. A. Behrend
Electric machines, Method of and means for operating dynamo-.....B. G. Lamme
Electric machine, Dynamo-.....G. B. Schley
Electric machines or motors, Brush-holder for dynamo-.....C. E. K. Zachau
Electric meter.....W. R. Whitney
Electric meter.....P. C. Morganthaler
Electric switch, Centripetal.....T. J. Downer
Electric testing instrument.....H. G. Addie
Electrical apparatus.....W. J. Foster
Electrical-distribution system.....R. Braun
Electrical-distribution system..... H. M. Hobart et al
Electrical equalizer system.....B. G. Lamme
Electrical equalizing system.....B. G. Lamme
Electrical equalizing system.....J. S. Peck
Electrical load-equalizing system.B. G. Lamme
Electrical indicating instrument..... H. L. Van Valkenburg
Electricity-meter.....S. H. Holden
Electricity-meter.....G. Hookham
Electromagnetically-controlled switch..... A. S. Cubitt
Elevator safcty device.....F. Bannon
Elevator safety device.....J. Cloos
Elevators, Automatic stopping connection for hydraulic.....T. Larsson
Embroidering, Method of.....R. Klemm et al
Emergency-brake.....W. D. Payne
Engine spark-ignition device, Explosive-..... J. A. Whitton
Envelop.....W. M. Smith
Envelop, Safety-.....J. T. Michaelson
Escutcheon-plate.....H. S. Lockwood
Etching apparatus.....C. Reverdys
Excavating bucket-head.....J. Kauth
Excavator and conveyer, Earth..C. E. Bearee
Exhibiting device.....E. W. Livermore
Explosion-engine.....R. D. Cody
Explosion-engine.....H. M. Cramer
Explosive nitro substances, Increasing the density of fusible.....C. E. Bichel
Extension-table.....A. S. El-Kouri
Eyeglass-mounting.....C. F. Ingold
Eyeglasses, Clamp for the frames of..... H. A. McDaniel
Fabrics with fluids, Treating....E. Gminder
Fan.....J. Russel
Fan-blade socket.....J. Russel
Fan, Rotary.....E. Glantsberg
Fastening.....E. Caldwell
Fastening device.....W. M. Wheildon
Fastening device.....G. W. Hoover
Faucet.....G. T. Kenly
Feed-bag.....E. Graff
Fence, Portable.....C. Wilson
Fence-wire clamp.....A. B. Doering
Fence-wire tightener.....F. N. Buckman et al
Fencing, Wire.....G. P. Rider
Fender.....B. Beckerley
File-cabinet, Credit-account...M. L. Stegmaier
File-holder.....E. G. Sampson
File, Paper-.....R. N. Pemherton
Filler.....W. A. Knight
Filler.....C. F. Gray
Filter-sand, Washing.....P. J. A. Maignen
Filtering apparatus.....A. J. Arbuckle
Finish-remover and making the same..C. Ellis
Fire-escape.....C. M. Sheeley
Fire extinguishers or appliances, Link for automatic.....W. A. Goldthwait
Fire-extinguishing system.....C. T. Robert
Fire-hose nozzle.....J. B. Winfield et al
Fire-lighting device.....J. Fero
Firearms, Cartridge-feed for.....A. B. Carey
Flag and banner support...E. H. B. Lindhorst
Floor polishing machine, Stone and concrete... F. O. Streed et al
Flushing-tank.....L. B. Yeiser
Flying-machine.....W. A. McCurd
Folding table.....W. A. Snyder
Friction-brake.....J. F. Cummings
Friction-coupling.....F. H. Richards
Fruit-box.....I. N. Hague
Fruit-gatherer.....J. T. Swan
Fruit-picker.....P. McConville
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Fuel-supply system.....M. M. Wood
Furnaces and the like, Air or gas preheating device for.....W. B. McLusky
Furnaces, Fuel-economizing apparatus for.... H. Luckenbach
Furniture and the like, Hook-lock for..... R. P. Maydl
Fuse-box.....H. W. Sheehy
Fuse for electric circuits, Renewable..... J. A. Volk, Jr.
Gage and bevel-square, Combination..... C. E. and W. H. Krueger
Gage for ruling-machines and the like..... O. E. Simon
Game-board..... M. Spillman, (now by marriage M. Kalesse)
Garment.....S. Weinschenk
Garment attachment.....C. Linborg
Garment, bifurcated.....H. M. Dunlap
Garment-hanger.....W. W. Grant
Garment-hanger.....H. H. Revman et al
Garment-supporter.....M. S. Erlanger
Gas-producer.....L. C. Parker et al
Gas-producer.....G. Akerlund
Gas-producers, Fuel-feed for.....E. N. Trump
Gas shut-off, Automatic.....W. E. Apt et al
Gaseous bodies, Apparatus for mixing, measuring, and carhureting.....A. Bouvier
Gate fastener, Wire-.....L. Wyssinger
Gear-cuttings, Hob for.....E. J. Lees
Gear, Variable-speed.....H. D. Williams
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Gelatoid thermoplastic compound..... B. B. Goldsmith
Gem cutting and polishing machine..... G. S. R. McMullen
Gin-feeder, Pneumatic.....J. W. Gregory
Glove.....A. E. Lindner
Golf-club.....C. W. Royce
Gong-striking mechanism.....H. E. Reeve
Governor, Explosion-engine.....H. M. Cramer
Governor-regulator.....C. W. Cramer
Grading machine, Road-.....H. K. Clemons
Grain-cradle.....J. H. F. Clifton
Grain-separator.....H. K. Hansen
Grain-separator.....M. Leonard
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Granaries and bins, Controlling device for.... F. R. McQueen
Grave-lining, 3 pats.J. M. and W. I. Doddridge
Grave signaling device..... C. R. Zimmermann et al
Grinding-mill, Centrifugal.....J. F. Custard
Grooved wheel for monorailway and tramway systems.....E. W. C. Kearney
Gum into sticks, Machine for breaking slabs of.....H. Y. Armstrong
Hair ornament.....A. Hochheimer
Halter 2 pats.....C. N. McClintock
Hammock-support.....J. J. Shultz
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Harvester-reel.....W. C. Leer
Harvester sickle-drive.....H. H. Kryger
Hay-carrier.....D. M. Motherwell
Heater.....W. S. Hamilton
Heating device, Eleetric.....W. Sprenger
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Heel for boots and shoes, Pneumatie..... J. V. Lambert
Height-gage.....F. O. Jaques
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Hollow cast ware, Apparatus for forming patterns for.....J. H. Danver et al
Hollow cast ware, Forming patterns for..... J. H. Danver et al
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Horseshoe.....W. Knieper
Horseshoe, Nailless.....H. D. Shaiffer
Horseshoe, Soft-tread.....M. Kane
Hose-clamp.....B. L. Morrison
Hot-air furnace.....F. E. Nelson
Hot-water heater.....W. Hawks
Ice-cream dipper.....F. Benjamin
Ice-cream freezer.....R. D. Moon
Igniting apparatus, Catalytic..G. Salomonsohn
Imprint or shoe stamping machine..... H. J. Holland
Index-tab.....C. J. Bryant
Ink-well.....J. F. Dobias
Ironing-board.....W. J. Stevenson
Ironing-board and step-ladder, Combined..... V. D. Cram
Ironing-machine.....W. R. Hager
Jacket-can.....F. Rudolph
Jar holder, Fruit-.....J. G. Dutschke
Joist-hanger.....H. C. Seipp
Journal-bearing....E. L. and W. S. Sharpneck
Keyhole-stop.....B. Hellman
Knife.....S. M. Bickford
Knitting machine, Rib-.....R. W. Scott
Knitting-machine web-holder, Rib-.R. W. Scott
Knockdown table.....W. J. Maddox
Laces, Forming tips for shoe-...M. A. Bartels
Ladder for picking fruit, &c...J. W. Stevenson
Lamp.....P. Krastin
Lamp, Alcohol-.....A. C. Fox
Lamp, Arc-.....B. Monasch
Lamp, Arc-.....W. C. Fish et al
Lamp attachment.....W. V. Williams et al
Lamp cleaner, Electric-.....E. E. Edgerton
Lamp, Miner's.....A. Brile
Lamp-shade support, Electric-....R. S. Furniss
Lamp, Vapor electric.....S. Ferguson
Lasting-machines and the like, Heel-band for bed.....G. V. Condon
Lavatory.....J. H. Gavin
Lavatory.....H. Podmore
Leather-dressing machine.....M. Fried et al
Leather-splitting machines, Spring-roll for.... J. H. Gay et al
Leather-working machine.....G. V. Anderson
Ledger, Loose-leaf.....T. R. Eddy
Level-indicating gage.....L. D. Lovekin
Leveling apparatus, Automatic.....A. Wain
Life-belt.....D. Bouwman
Life-preserver-holding rack.....M. Blow
Lifting device.....L. E. Fosdick
Lifting-jack.....H. A. Schatz
Lighting-fixture.....F. W. Wakefield
Liquid-dispensing device.....W. M. Byer
Liquid-dispersing vessel, 2 pats.L. G. Langstaff
Liquid-impelling apparatus.....W. B. Moore
Lister-guide.....G. W. Groseclose
Lock.....W. M. Peebler
Lock.....G. Merlonetti
Lock.....W. J. Lambert et al
Locomotive-cab-window ventilator..... C. M. Goodrich
Locomotives and the like, Pilot for, 2 pats.... C. T. Westlake
Locomotives, Device for disposing of ashes and cinders from.....T. S. Leake
Logs, Float for.....W. J. Pierpont, Jr.
Loom.....W. R. Burrows
Loom weft-replenishing mechanism..C. Klein
Lubricating device.....J. M. Tibbs
Mail-box, Rural.....C. F. Farrar
Mail-exchange, Automotor.....F. Mercer
Mail-rack.....J. C. Kinsman
Marble slabs, Device for connecting..... F. O. Streed
Match-box and cigar-clipper, Combined..... J. C. Harrison
Match-case and cigar-tip cutter, Combined.... G. L. Buckman
Match dispenser and igniter, Combined..... E. Lamprecht
Measure, Automatic grain-.....J. H. Royer
Measuring attachment for micrometer-calipers.. C. Bosworth
Measuring instrument.....E. Thomson
Measuring instrument.....I. L. Davenport
Measuring instrument, Electrical..... W. J. Lloyd et al
Measuring power, Method of and apparatus for J. Harris
Measuring, winding, and rewinding machine, Cloth.....A. Knobel
Meat, &e., Machine for larding...D. Deehert
Mechanical movement.....R. Shedenhelm
Mechanical movement.....F. H. Richards
Mercury-meter.....F. Holden
Metal-box edges, Machine for trimming..... F. E. Adams
Metal-shaping machine.....P. W. Jones
Metal-working-machine stop-motion..... E. R. Seward
Milking-machine.....D. Klein
Milking-machine.....P. F. Klein
Mine ventilation, System of.....D. Belloni
Mixer for culinary use.....E. Schmitz
Molds, Method of and apparatus for forming.. F. W. Taylor et al

Mixers, Muffler for.....J. F. Parker
Molds, Tool for stopping run-outs in.....E. W. Conarton
Motor.....C. Enrietti
Motor control system, Electric-, 3 pats.....H. D. James
Motor controlling device.....R. M. Klein et al
Mouth and nose protector....B. Woolf et al
Mowing-machine buncher attachment.....N. G. Hanna
Necktie-holder.....W. Downing
Nozzle.....G. Jackson
Nozzle, Spraying-.....J. B. Winfield et al
Nut-lock.....A. E. Zeese
Oar-blades and the like, Device for forming..M. A. Strand
Oil or gas engine.....E. Thomson
Ordnance sighting apparatus.....A. T. Dawson et al
Ore-feeder.....E. F. Gustafson
Oscillation-receiver.....G. W. Pickard
Oven-operating mechanism, Rotary-.B. F. Fish
Overalls.....W. F. Harbour et al
Packing.....N. B. Miller
Packing-box.....L. P. Rexford
Packing device for pistons, piston-valves, and the like.....J. Jones et al
Packing, Shaft-.....W. L. R. Emmet
Pail, Straining-.....P. L. Sennott
Paper-bag holder.....M. A. Macomber
Paper-bag machine, 2 pats.....E. E. Claussen
Paper cleaning, Waste-.....V. P. Schmidt
Paper, Device for folding and dividing strips of.....E. Klein
Paper envelops suitable for packing bottle, &c., Machine for the manufacture of corrugated..J. E. and A. Tascher
Paper-machine.....S. E. Dart
Paper material.....M. A. McGuire
Paw, Artificial.....H. Baehr et al
Pegging-machine.....L. A. Casgrain
Pen-ejector.....M. D. McOmber
Pencil-sharpening device.H. G. Hubener et al
Peramhulator-brake.....C. West
Permutation-lock.....P. Ziron
Phonograph, Automatic multiple-record.....J. I. Gemmill
Photographic roller-blind shutter.....J. E. Thornton
Piano-players, Pedal for.....C. F. Jones
Pianos, Rewinding mechanism for pneumatic..A. Nordeen
Picture machine, Moving-.....J. A. Crosby
Picture machines, Lens-shield for moving-....G. J. Gilmore
Pile-driver.....E. J. Stone
Pillow, Collapsible..J. M. and W. I. Doddridge
Pillow, Collapsible grave-.....J. M. and W. I. Doddridge
Pineapples, Machine for treating.....G. W. Zastrow
Pipe-coupling.....C. R. Schmidt
Pipe-joining machine.....J. A. Pittman et al
Pipe-threading tool.....B. Borden
Piston for steam-engines, Insulating-.....F. A. Pritschau
Planer.....J. and J. Albert
Planter.....J. H. Lee et al
Planter, Corn-.....V. F. Pavey
Plate-machine.....T. J. McCullough
Plates, Making ribbed.....F. H. Richards
Platter, Serving-.....E. H. H. Smith
Plow.....J. R. Rossetter
Plow attachment.....F. W. Meyer
Plumbing-system fitting.....C. R. Schmidt
Pocket-knife and cigar-clip, Combination.....H. J. Ruppert et al
Pocket-knife, Disjointable.....F. W. Klever
Pole-changer.....N. L. Wine
Post and brace therefor.....W. Haight
Potato-digger.....J. Moreau
Potato-digger.....A. Grala
Potato-digging machine.....C. W. Markel
Power plant, Hot-liquid.....G. Sautter
Pressing-machine.....H. Lindestrom
Printer's border.....A. C. Gustafson
Printing-press.....H. A. Toren
Printing-press feed-gage.....C. J. Harrison
Printing-press gripper, 2 pats....F. D. Hake
Printing-press registering-gage..J. O. Hankins
Propeller.....L. Balog
Pruning implement.....H. H. Boenker et al
Pump.....J. E. Shutt
Pump.....J. G. Callan
Pump.....F. D. Winkley
Pump, Air-.....F. E. Ten Eyck
Pump and like machine, Rotary.J. L. Hanman
Pump, Self-measuring oil-.....F. I. Young
Pump spout, Whey-.....A. M. Steinwand
Punching and shearing machine, Combined....H. N. Kluting
Punching-bag.....S. W. Johnson
Quilting-frame.....L. A. Smith
Rail-brace.....J. O. Morris
Rail brace, Track-.....W. B. Snodgrass
Rail-clamp.....H. M. Plaisted
Rail-fastening.....H. E. Percival
Rail, Guard-.....C. W. Reinoehl et al
Rail joint and chair.....C. D. Wright
Railway construction.....R. Waples
Railway cross-tie.....R. Waples
Railway-rail.....C. A. Alden
Railway-rail fastening.....C. Knopf
Railway-rail support.....C. W. Reinoehl et al
Railway safety device.....J. W. Ledwon
Railway signal and train-controlling mechanism.....E. Flora et al
Railway signaling system, Electric.F. Lacroix
Railway signaling system, Electrical.....C. Crandall
Railway-switch.....D. B. Broadwater
Railway-switch.....F. Zele
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Railway-switch.....F. H. Kaiser
Railway-tie.....E. A. Buell
Railway-track.....E. A. Buell
Receptacle.....E. Ludescher
Receptacle-opening device.....G. C. Weber
Reflector, Burner-flame.....J. G. Harvey
Reflector support and socket, Combined.....W. H. Spencer
Refrigerating apparatus, Ammonia-condenser for.....H. W. Colby
Refrigeration process.....W. W. Seay
Refuse-can.....E. Sandstrom
Reversing mechanism.....F. J. Ball
Rheostat.....P. H. Zimmer
Rheostat and controlling device.H. D. James
Rifle, Magazine-.....W. G. Kramer
Rock-drill, Rotary.....C. S. Cox et al
Roller.....H. R. Derby
Rolling sheets.....A. Paterson (Reissue)
Roofing fabric, Ready-.....J. Ayrault
Roofing fabrics, Mandrel for reeling ready-..B. G. Casler
Rossing-machine.....J. Moreau
Rotary engine.....R. W. Riordan
Rotary engine.....V. M. Fulcher
Rotary engine.....A. MacDonald
Rotary motor.....C. R. Wolcott
Rotation-indicating instrument.....H. P. C. Browne et al
Rule.....W. Klie
Sack-turner.....G. R. Bartholomew
Safety-elevator.....J. Driscoll
Safety-switch.....F. Smith
Sash-fastener.....F. L. Naylor
Sash-fastener.....F. F. Pinnow
Sash lock or fastener.....W. M. Shaw
Sash supporter and lock.....W. W. Sweetland
Saw-case.....W. Stevenson
Saw-frame.....H. J. Leland
Saw lubricator, Hand-.....C. E. Lowe
Saw machine, Hack-.....A. Gruitsch
Saws, Double-jack swinging bracket for gang-..L. G. Johnstone
Sawing-machine.....D. I. Keough
Scale attachment, Weighing-...S. M. Boling
Scale-beam attachment, 2 pats...S. M. Boling
Score-card for games.....A. E. Roberts
Scraper.....J. Ziegler
Scraper, Road-.....J. A. Miller
Scraper, Wheeled.....C. H. Sawyer
Screw-cutting device, 2 pats.....L. F. Hart
Screw-driver.....C. Kummer
Screw-driver.....A. Loewenberg
Seal.....M. H. V. Battenberg
Seal for rotary apparatus, Liquid.F. Samuelson
Sealing fruit-cans and the like....W. Plinatus
Semaphore-signal.....S. H. Harrington
Sewage-treatment apparatus.....K. Imhoff
Sewer-vent.....H. C. Williams
Sewing-cabinet.....M. A. Gensler
Sewing-machine.....M. Hemleb
Sewing-machine.....L. F. Fales
Sewing-machine thread-cutting device.....E. H. A. Habbert et al
Shaper-guard.....J. Loeffler
Shaper-guard.....P. Erickson
Sheet, Bed and crib.....E. R. Carswell, Sr.
Sheet-metal can.....F. Westerbeck
Shirt-suspensory.....W. S. Wootton
Shock-absorber.....C. H. Newton
Shock-absorbing coupling....H. Villiers-Stuart
Sight.....D. Briant
Sign-receptacles, Fastening for electrical.....E. H. Freeman
Signal mechanism.....W. V. Moak
Signal mechanism for overhead-trolley systems, Electric.....H. A. Lines
Signal system.....W. H. Kirnan
Signaling device for doors.....A. H. Long
Signaling, Receiver for wireless...H. C. Cayley
Single-phase motor.....S. R. Bergman
Sink traps to slop-sinks, Adjustable connection for slop-.....J. H. Gavin et al
Siphon.....S. J. Graham et al
Skiving-machine.....P. R. Glass
Skylight-bar.....C. Schroeder
Slicer, Vegetable-.....E. P. Lang et al
Slug-casting machine.....J. R. Rogers
Smelting iron oxids.....H. W. Lash
Smelting of iron oxids, Electric....H. W. Lash
Snap-switch.....J. H. Wyatt
Snow-clearing machine, Railway..F. C. Harris
Soldering-iron, Electric.....T. Van Aller
Soldering machine, Can-.....H. K. Smith
Sound-reproducing-machine attachment.....T. P. Reed
Spark-plug.....F. W. Smith
Speculum, Mouth-.....G. J. Reed
Speed-transmission device, Variable-.R. Janney
Spike.....J. W. Balfour
Spinning machines, Holder for travelers used in cotton-.....J. H. Cobb et al
Spring-equalizer.....F. H. Warner
Spring-power motor.....C. A. Johnson
Spring-wheel.....J. W. Benson
Spring-wheel.....W. G. Marr
Stalk-rake.....W. Nicholson
Stamp-lifter.....B. F. Coleman
Stand-boiler.....L. S. Lawson
Steel from low-grade material, Producing high-grade, 2 pats.....W. R. Palmer
Stereotype-metal, Facing.....W. R. Fisher
Stereotype-plate-casting apparatus.....H. F. Bechman
Stone-saw, Circular.....C. C. Griswold et al
Stool, Outing-.....R. H. Durand
Stovepipe-joint, 2 pats.....J. T. Sappenfield
Strainer.....W. T. Russell
Stuffing-boxes, Smoothing and truing ring for..A. H. Franke
Stuffing-machines, &c., Feeder for..P. F. Cox
Sulfur-burner.....P. H. Grimm
Superheater-boiler.....J. E. Bell
Switch.....L. Quattehaum
Switch and detector-bar throwing mechanism..C. R. Keeran
Switch lock, Railway-.....J. O. Hale
Switch mechanism, Automatic...F. M. Oeder
Switch-thrower for electric railways.....T. C. Reynolds
Swivel.....J. Wennstrom
Table.....G. A. Myers
Tack-feeding device.....B. B. Waterman
Tag.....G. H. Taylor
Talking-machine.....A. Keller
Tap for tanks, oil-drums, and the like.....M. Goodwin
Tape-grip.....L. D. Richardson
Target-signal.....E. F. Bliss
Telephone-circuit supply system.....J. L. Hall
Telephone-lines, Means for disconnecting....M. Bowman
Telephone system.....E. E. Yaxley
Telephones, Lock-out device for common-battery.....R. D. Harris et al
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Testing-machine.....T. Y. Olsen
Thermometer.....H. W. Maurer
Thill-support.....M. E. Covey
Threshing-cylinder.....T. G. Leavell
Ticket-cutter.....E. D. Fritch
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Tire antiskidding attachment, Wheel-.....G. A. Lyon
Tire-armor.....W. O'Neil
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Tire, Pneumatic.....D. McArthur
Tire-protective rivet.....E. B. Stimpson
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Track-brake.....W. W. Allen
Track construction.....H. C. Grant
Train-indicator.....F. Ehretsman
Train-order cabinet, Safety.....C. B. Hanley
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Transom.....J. H. Gilman
Transom-operating device, Self-locking.....G. Dickie
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Trip mechanism.....W. H. Smith
Trolley harp and wheel.....F. E. Hancock
Trolley-pole guiding and finding device.....J. J. Jagolin
Trousers-clasp.....A. L. London
Truck.....R. A. Rowley
Truck, Automobile-.....H. L. Parrish
Truck, Car-.....G. G. Floyd
Truck, Railway-car, 2 pats.....G. G. Floyd
Tube-blower.....C. C. Grover
Tube-repairing device.....J. M. Galloway et al
Tubing, Flexible metallic.....B. E. Eldred
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Tumbler, Soda-.....H. K. De Wolf
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Twisting and doubling frame.P. B. Whitehead
Type-casting machine.....F. H. Pierpont
Type-machine controlling mechanism.....J. S. Bancroft et al
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Type-writer adding attachment.....C. H. Gill
Type-writing machine.....A. T. Brown
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Type-writing machine.....F. A. Young
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Type-writing-machine duplicating attachment...A. G. Sherwood
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Umbrella-runner, Ball-and-socket.C. L. Baker
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Valve actuator and indicator..F. H. C. Mey
Valve and connection.....G. P. Carroll
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Valve, Electric expansion-.....G. P. Carroll
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Valve, Pressure-retaining.....B. J. Minnier
Valve, Safety gas-.....D. Ambrose
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Vaults, Plastic compound for making burial-..J. H. Colgrove
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Vehicle-body attachment.....J. P. Colburn
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Vehicle frame, Motor-.....C. Schmidt
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Vehicle-wheel, 2 pats.....H. O. Peck
Vehicle-wheel.....R. H. Rice
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Vertical boiler.....H. O. Keferstein
Vessel-closure.....C. Hubert (Reissue)
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Vitreous ceramic surfaces, Metalization of....O. Marino
Voice-reflector.....A. Carbone
Wagon-loader.....A. D. March
Washer or button feeding attachment for setting-machines.....S. Grossman
Washing apparatus, Sheet-.....I. W. Marshall
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Water-closet.....F. H. Henning
Water-closet, Marine.....G. A. Diem
Water-motor.....F. W. Mackey
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Weighting apparatus.....A. Bradford
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Wind-shield.....J. H. Sprague
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Window-easing-pocket closure...H. Hougham
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Badge.....J. A. Booty
Emblem.....A. L. Wild
Gas-burner for street-lights, Inverted.....V. H. Slinack
Glass dish, Cut-.....R. H. Pittman
Hosiery, Article of.....W. D. Butz
Lamp, Gas-.....C. W. Harrison
Lighting-fixture.....H. T. Howell
Match-holder.....G. Mueller
Oven-door.....E. H. Huenefeld
Picture-frame.....E. Taube
Rack for holding articles.....J. W. Ball
Range, Gas-.....W. M. Crane
Reflector or similar article.....O. A. Mygatt
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Shaving-stand.....E. O. Damen
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Toilet compounds, Receptacle for..R. Ruzicka

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Agricultural implement.....A. C. Lindgren
Air-brake apparatus, Automatic....J. O. Dodge
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Alcohol-burner.....D. F. Baker
Alloy for armor-plates and other uses.....E. Schneider
Anchor and wall-packer, Combination.....C. M. and J. W. Heeter
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Ball-player's armor, Base-.....W. J. Sullivan
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Battery systems, Apparatus for ventilating and cooling storage-.....S. Lake
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Bed, Invalid-.....T. Taylor et al
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Bedstead corner-fastening.....F. W. Reuter
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Bevel-gage.....O. P. Staley
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Binder.....A. Faifer
Binder, Loose-leaf.....C. M. Cott
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Block railway-signal, Electric...E. B. Samuels
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Boiler-setting.....J. H. Simpkins
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Bolt-severing machine, Stay-.....G. S. Lowe
Bookcase, Sectional.....J. M. Canse
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Bottle, Antirefillable.....E. A. Lambert
Bottle heater, Water-.....H. W. Christian
Bottles, packages, and the like, safety holder or receptacle for.....S. C. Loomis
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Box-fastener.....A. M. Amberg
Box top, Powder-.....W. H. Perkins
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Brick and block mold.....C. W. Jones
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Burial-casket and vault therefor, Combined.....J. Topol
Butter-cutting machine.....E. S. Wells
Cable-chain-grip systems, Switch for automatic.....G. S. Fouts
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Can attachment, Oil-.....P. Cowgill
Can-body forming and soldering machine.....J. Eldridge
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Canister, Non-refillable.....N. I. Harrington
Car-brake.....J. W. Lamoreaux
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Car, Concrete.....J. B. Strauss
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Car-derailing device.....C. W. Reinoehl et al
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Car emergency-brake, Street-.....J. Hauser
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Car-stake.....R. J. Braun
Car-step-raising device.....W. W. Brown
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Car-underframe.....H. M. Pflager
Carbureter.....A. Winton et al
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Carton or package.....W. I. Fell
Cash-register.....F. C. Osborn
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Casting metal structures in permanent molds having permanent cores.....E. A. Custer
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Chain-links, Making.....J. M. Dodge
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Cheese-protector.....F. J. Lindsay
Chimney.....E. Banzhaf
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Churn....E. E. Rippey
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Cigar-bunch molds and releasing the bunches therein, Apparatus for opening..J. R. Schmitt
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Columns, Mold for making fluted....J. P. Archdeacon
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Concrete hog-trough and valve..J. Robertson
Concrete-reinforcing bar....E. Cannes
Concrete structures, Reinforcing means for....E. R. Boyle et al
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Cooling device for rooms....D. F. Solliday
Cores, Ventilating means for laminated....A. J. Brown
Corking apparatus, Bottle-...C. Sellenscheidt
Corn-husking hook....R. N. Thomas
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Cotton-chopper....A. D. Beil
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Cotton-tramper, Automatic...E. H. Campbell
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Crane, Power-....S. J. Webb
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Crate or box....B. K. Boyd
Crate, Shipping....T. A. Redick
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Currycomb....G. M. Hubbard
Curtain-draping apparatus...M. A. Tompkins
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Curtain-holder and bracket, Extension....G. A. Milholland
Curtain-stretcher....J. Stawartz
Cuspidor....A. Eggenhofer
Damper, Fireplace-....W. R. Champion
Dentador or sanitary cuspidor..A. R. Mitchell
Dental-place-casting apparatus...F. W. Tracy
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Drain for counters, &c....E. C. Frost
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Dust, Pneumatic device for collecting and removing....A. E. Moorhead
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Egg-case filler....H. B. Collins
Electric apparatus, Vapor....C. Bradway
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Electric-current regulator....H. A. Keip
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Electric machine, Alternating-current dynamo-....W. Stanley
Electric machine, Alternating-current dynamo-....B. Elshoff
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End-gate....C. S. Wright
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Entrail-cleaning machine....L. Svoboda
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Envelop, Pocket-....O. C. Sweet
Equalizer....W. H. Pickle
Eraser cleaner, Blackboard-....A. Ilstrup
Excavating and hoisting device...W. Webster
Excavating-bucket....W. C. Mitchell
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Faucet, Quick-closing....H. F. Schroeder
Feed-bag supporter, Triple-....E. J. Colgan
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Gas-holders, Guide-frame for....H. J. Stoffels
Gas-producer....L. F. Burger
Gas-producer....G. Hatton
Gases and vapors, Apparatus for administering....G. von Ach
Gases, Composition for oxidizing and purifying explosion-....H. Walker
Gaseous-fuel burners, Lighting attachment for....C. E. Heft
Gate....G. W. Traxler
Gate....F. Adams
Gate....H. P. Liles
Gearing....E. C. Gesche
Geography-illustrator, Mathematical....W. H. Keller
Glass articles, Making pressed-..O. A. Mygatt
Glass-furnace....H. Brooke
Go-cart or baby-carriage....A. J. Adams
Gradients, Means for and method of determining potential....W. Stanley
Grate....J. and W. Reagan
Grate, Shaking-....J. and W. Reagan
Grinding machine, Multispindle metal-....W. L. Bryant
Grinding-mill....A. Bock et al
Grinding-wheel stand....G. E. Soper
Grindstone attachment....J. Sylvestre
Gun, Automatic....A. T. Dawson et al
Gun firing mechanism....A. Y. Leach, Jr.
Gun-rammer....J. F. Meigs et al
Hame-fastener....P. W. Napierala
Hame-tugs, Metallic loop for..E. H. Gulliom
Harmonica....R. L. Lanier, Sr.
Harvester-conveyer....A. M. Anderson et al
Harvester, Corn-....J. A. Stone
Harvester, Corn-....T. H. Butler et al
Harvester-reel attachment....A. M. Sonnichsen
Harvester, Stripper-....C. A. A. Rand
Hat-bodies, Machine for clipping blocked....J. H. Starr
Hat ventilator attachment....F. R. Skidmore
Hay-press....F. A. Ryther
Heat of combustion and steam-power in prime movers, Utlizing....T. Schtscherbakoff
Heating apparatus, Hot-air forming and feeding device for....J. Eckert
Heating system, Convertible....E. H. Gold
Heel-plate....E. Frank
Hinge....H. E. Hoke
Hinge mechanism for windows, &c..T. I. Duffy
Hinge, Spring-....H. W. Steele (Reissue)
Horse-controlling device....L. E. v. Czillinger
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Hose-coupling....H. P. Magone
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Hose-supporter....J. F. Stoldt
Household utensil....S. D. Smith
Igniter, Electromagnetic....C. S. Beardsley
Indicator....H. H. Shults
Initiation device....E. De Moulin
Internal-combustion engine....L. E. Fish
Internal-combustion motor....C. H. Atkins
Jack-spools, Holding means for....L. T. Houghton
Kitchen utensil....J. S. Grenn
Ladder, Extension-....H. and L. Mote
Ladder, Jointed....L. W. Rentfrow
Lamp-burners for incubators....W. S. Ault
Lamp construction....W. Herwig
Lamp, Incandescent....C. C. Woodworth
Lamp receptacle, Multiple-cluster-...F. S. Ober
Lamp-shade....W. J. Gray
Lamp, Vehicle-....H. W. Beebe
Lamp, Vehicle-, 2 pats....J. K. Punderford
Lamps, Adjustable support for vapor-....S. E. Flichtner
Lamps, Supplemental light for....E. E. Taylor et al
Lamps, Treating metallic filaments for electric incandescent....W. Majert
Land roller, pulverizer, and seed-planter, Combined....V. D. Curtis
Lantern, Beacon or anchor....F. P. Coulter
Lasting-machine....F. W. Roberts et al
Latch, Gate....T. Dailey
Lawn-trimmer....C. E. Waters
Lenses, Producing bifocal....C. W. Conner
Letter-box....J. A. Steinmetz
Letter-tying device....B. P. Greenwood
Line-casting machine....R. G. Clark
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Line-casting-machines, &c., Keyboard mechanism for....J. R. Rogers
Linotype-machine, 2 pats....F. B. Converse
Linotype-machine....J. R. Rogers
Loek....P. S. Dunn
Lock....L. Faust et al (reissue)
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Locking detachable joint....B. Rothschild
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Logging-grab....W. P. Smith
Loom, Automatic filling-replenishing....J. Northrop et al
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Loom starting and stopping mechanism....A. E. Rhoades
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Lunch-box....P. J. Bird
Machine-knives and making the same, Composite stock for....F. Searle
Magnet....H. Ruthardt
Mail catching and delivering apparatus..J. Wood
Mail-handling apparatus, Pneumatic....T. M. Riggle et al
Mail-loader....T. B. Modlin et al
Mail receiving and delivering apparatus....A. D. Wack
Marble shooter or gun....J. A. Radebaugh
Marking-machine....G. C. Kutz
Match-box....F. E. Lafler
Match-box....I. C. Lang
Match-holder....W. A. Smith
Match receptacle and igniter, Combined....E. Lamprecht
Measuring-glass....A. Kipp
Measuring instrument....J. Green
Mechanical movement....D. K. Wilson
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Motor....A. P. Barnes et al
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Mower track-clearer....G. Braun
Multiple drill....H. E. Hawes
Music-rack....J. C. Dillon
Musical instruments, Combined brake and rewinder for automatic....J. Skubis
Needle....E. M. Sanders
Nipple....T. W. Miller
Nose-glasses....B. J. Knapp
Nozzle-holder....E. Burns
Nozzle, Hydraulic....W. A. Doble
Nozzle, Syringe-....E. T. Pearl
Nut-lock....A. McKinley
Nut-lock....W. E. Hall
Nut-lock....E. M. Lovell
Nut-lock, Combination....J. Sharp
Oil-burner....W. S. Robinson
Oil-burner, Adjustable downdraft..D. C. Lamb
Oil-switch....H. W. Cheney
Oiler, Fountain-....O. O. Aune
Opera-chair....A. R. Milner
Optical instrument....A. Hahn
Ore-feeder....N. V. Fitts
Oven-door holder or catch....O. P. Moon
Package....O. R. Tyson
Packing-casing....C. L. Cook
Packing, Metallic....C. L. Cook
Pail....A. Cleveland
Pantograph....H. A. Verbeck
Paper and wood-pulp receptacle....J. W. McCleery
Paper-feeding machine....T. C. Dexter
Paper package....C. F. Jenkins
Paper pail....W. G. Haas
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Paving-block....W. Hanley
Peanut picker and stemmer....J. T. Benthall
Penholder....A. W. Pegg
Percolator, 2 pats....E. S. Peck
Photographic-plate holder....J. Goddard
Pickle-cabinet and banana-display tree....I. N. Davis
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Pipe-coupling....A. T. Herrick
Pipe flashing, Soil-....R. C. Ricker
Pipes, &c., Covering for carthenware..E. Henss
Planter, Potato-....A. McWhorter
Planters, Automatic dropper for corn-....J. B. Erway
Plow, Saw grub-....W. N. Thurman
Plow, Sulky-....W. L. Paul
Plows, Disk fender for....D. J. Welch
Polychloranilin derivative....C. Schraube et al
Post-foundation....J. L. McClintock
Post or column....L. A. Brown
Potato digger and separator....G. A. Freer
Poultry-picking frame....F. F. B. Chapman
Power transmission....F. Porsche
Power-transmission mechanism..J. L. Locke et al
Presses, Web-controller for..F. W. Rolland, Jr.
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Printing-machine....J. Collison
Printing-press....W. F. S. Ferry
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Pulp-strainer....H. Stub et al
Pump, Oil-well....W. R. Ritchie et al
Pumps, Automatic air-trap for..C. S. Axford
Punch, nail-set, &c., Center-..F. W. Bacho et al
Puzzle....A. B. and R. F. Carty
Radiator-fins, Holder for....J. D. Beebe
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Railway, Pleasure-....W. F. Mangels
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Railway-rails, &c., in the welding process, Clamping apparatus for clamping and butting....H. Goldschmidt et al
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Reamer, Expansion-....J. E. Schaeffer
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Refrigerating-machine, Absorption..T. J. Kirn
Refrigeration proeess....W. W. Seay
Refrigeration system....A. Day
Refrigerator....A. V. Rowe
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Remedy for eczema....W. N. Ringer
Rheostat....W. G. Abbott, Jr.
Rim, Demountable....B. R. Tillson
Road-roller....J. V. Miller
Rock-drill....S. Ferguson
Rod-coupling....H. H. Pofahl
Rodent-exterminator....D. L. Levey
Rotary engine, Compound....J. A. Eaton
Safety-switch....J. E. Mustard
Sand-blast apparatus....J. C. Pangborn et al
Sandpapering and polishing machine....F. A. Oehm
Sash fastener, Window-....D. S. Reinhart
Sash-holder....J. W. Wooley
Sash-lock....J. C. Luden
Sash lock, Window-....F. D. Raforth
Saw, Hack-....G. H. Couper
Sawing-machine, Portable....C. M. Barker
Scaffold, Building-....D. A. Murdoch
Scoop, Power-....E. P. Lorch
Seal, Box-, 2 pats....E. J. Brooks
Sealing device, Box-....E. J. Brooks
Separator....E. S. Peck
Sewing knitted fabrics, Maehine for..G. Keyser
Sewing-maehine guiding device, 2 pats....W. A. Fox
Sewing-machine needle....F. Johnson
Sewing-machine ruffling device....F. M. Card
Shade and curtain rack....J. M. Coughlan
Shaft-collars, Making....H. T. Hallowell
Shaft-tug and hitching device....A. Latourelle
Shoe-calk....J. S. Kerr
Shoe-jacks, Table attachment for..J. M. Faulk
Shoe-tree....W. D. Wilder et al
Shoe-ventilator....H. J. Hicks
Sieve, Adjustable....C. Closz
Sight-testing apparatus....J. H. Tomlinson
Sign-exhibitor and display-rack....E. G. and G. H. Cuny
Sign, Revolving....M. Heim
Sky-rocket....A. L. Due
Sleeve-protector....H. Sacks
Slipper-package....M. Woodbury
Snow-plow....W. J. McFarland
Snow-shovel....R. Wolf
Soap-dispensing apparatus, Liquid-....E. M. Frank et al
Soap-holder....W. M. Parker
Sole-leveling machine....J. H. Rigby
Sound-reproducer....R. B. Smith
Speedometer....J. H. Bullard
Speedometer-indicators, &c., Maximum-hand for....J. W. Jones
Spike-puller....R. F. Bramstadt
Splint-holding frame....W. H. Parker
Stacker, Hay-....D. R. Long
Stapling-machine....A. R. Tiffany
Steam-regenerative apparatus..L. P. L. Battu
Steam-trap....A. D. Horne
Steeping apparatus....A. W. H. Lenders
Steering-gear, Gyroscopic....F. M. Leavitt
Step, Extension-....E. F. Howell
Step-switch, Regulating....B. M. McInnerney
Stock-salting device....B. R. Bonney
Stoker, Mechanical....J. and W. Reagan
Stone-sawing machine....G. L. Fuller
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Stop, Non-reversing....R. J. Moulton
Stove, Regenerative....A. C. Nelson
Strainer, Liquid-....A. Schwieger
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Sulfur, &c., from furnace-gases, Obtaining....F. R. Carpenter
Suspension of high-tension lines....H. W. Buck et al
Swingle-tree....M. M. Wheeler
Switch....G. W. Hart
Talking-machine sound-modifier..E. P. Shepard
Tank safety device, Pressure-....H. C. Hanson
Tantalum, Hardening....W. von Bolton
Target....H. C. Peffer
Target....F. J. Johnston
Telegraph-key....L. Wilson
Telegraph-transmitter....C. W. Leiser
Telephone-exchange system....W. A. Fricke
Telephone-transmitter appliance....E. F. Hutton et al
Telephone-transmitter appliance..O. H. Goodrich
Telephony....G. C. Cummings
Thimble....B. C. Callender
Thimble....T. Weigle
Thresher, Traveling....G. O. Walters
Tide and wave motor....C. S. Kendall
Tile press-mold....W. P. Meeker
Timer....F. A. Putnam
Tire....C. H. Keiffer
Tire, Elastic vehiele-....C. Motz
Tire, Elastic vehicle-....C. A. Motz
Tire-patch....J. A. Wheeler
Tire, Vehicle-wheel....G. W. Lilley
Tire, Wheel-....J. D. Marvil
Tire, Wheel-....A. Birnbaum
Tobacco-cutting machine....R. E. Rosewarne
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Toilet article....J. Babst
Tool-holder, Friction....B. F. Vickery
Top, Double....E. Vuillaume
Torpedo....E. P. S. Andrews
Torpedo-launching device....S. Lake
Torpedo-steering mechanism....F. M. Leavitt
Torpedoes, Turbine installation for....S. Z. de Ferranti
Towel-rack....B. S. Gruner
Toy-bank lock....C. Hansen
Toy top....J. A. Irving
Track-brace....M. P. Bardon
Tracket-bar....J. J. Kelin
Train-stopping mechanism....J. F. Webb, Jr.
Transits and hand-levels, Attachment for engineers'....F. W. Austin
Transom and window operating mechanism....F. A. Bickley
Trestle, Paper-hanger's folding..F. H. Skinner
Trick-platform....E. De Moulin
Trolley attachment....F. V. Polakoskey
Trolley holding and retrieving device....J. W. Woodward
Truck....F. W. C. Bailey

Truck, Fodder-binding.....W. A. Forbes
Truck, Motor-.....A. Christianson
Trunk or package hinder.....J. E. Emhry
Truss.....C. Molz
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Turbine.....E. I. Braddock
Turnhuckle.....W. Hardick
Type-bar.....E. E. Taliaferro
Type-casting machine.....W. H. Brueckmann
Type-writer adding-machine attachment.....
.....L. M. Daniel
Type-writer ribbon-positioning device..G. Trejo
Type-writing machine.....E. Thürey
Type-writing machine.....J. H. Barr
Type-writing machine.....J. C. McLaughlin
Type-writing machine.....F. A. Cook
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Type-writing machines, Paper-directing attachment for.....B. P. Gibbs
Valve.....E. H. Gold
Valve.....G. F. Speer
Valve-actuating mechanism.....G. B. Petsche
Valve, Gate-.....W. W. Doolittle
Valve-operating mechanism, Electrically-controlled.....H. W. Zook
Valve-operating mechanism, Flush-.....
.....J. M. Young et al
Vapor-burner.....W. Tuppstedt
Vegetable-cutter.....J. P. Spacek
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Vehicle-brake.....J. H. Wesson
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Vending-machine.....E. B. Shanks
Vessel, Submarine.....S. Lake
Vessels, Navigating-turret for submergible....
.....S. Lake
Violin-support.....F. R. Johns
Wagon-brake, Automatic.....H. J. Williams
Washing-machine, Rotary.....H. Stitzel
Water-heater.....E. A. Peterson
Water-wheel gate-controlling mechanism.....
.....A. Reid
Waterer, Stock-.....P. Bernard
Way-hill.....F. H. Crump
Well-drilling machine.....G. W. Smith et al
Wheel attachment for dragging logs and heavy loads.....J. H. Long
Wheel bearing mechanism, Vehicle-.....
.....C. F. Umholtz
Whip-socket lock.....J. B. Hollenbeck
Windmill-regulator.....A. D. Dusenbery
Window-fixture.....A. F. Girouard et al
Window lift and lock, Combined....I. Johnson
Windows, &c., Apparatus for cleaning.....
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Wire-fabric-making machine..A. L. Kitselman
Wire-polishing machine.....H. Janssen
Wrench.....R. M. Ryan
Wrench.....N. S. Stalker
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DESIGNS.

Badge.....E. H. Humphrey
Badge.....G. G. Greenhurg
Bag, Hand-.....I. J. Levy
Bottle.....M. and S. Liehenthal
Bottle.....C. D. Mawer
Button.....J. Melillo et al
Chair.....L. Killian
Coffee-hin.....F. F. Wear
Comb, Hair-dressing.....J. I. Rice
Desk and chair frame, School.....H. J. Siems
Emhlem.....J. H. Risheck
Emhlem.....J. E. Swalwell
Flag.....J. J. Butcher
Medal or emhlem.....W. D. Simmons
Paper or similar article, Wall-..N. G. Stratton
Pen or pencil retainer.....W. F. Duryea
Post-card.....I. Grollman
Rug.....A. Petzold
Seal.....J. B. Wendt
Sink.....F. H. Caldwell
Spoon.....A. F. Saunders
Spur-hody.....F. C. Monier
Tahle, Game-.....C. Hine
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Toilet-compound receptacle.....E. Horter
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Adding and suhtracting machine.....
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Adding-machine.....J. C. Vincent
Advertising device, Automohile..G. Heales et al
Advertising device for paints, calcimines, &c.
.....H. W. Pearson
Aerodrome.....H. A. Orme
Aim-recording apparatus.....J. B. Bolitho
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Ash-pan and hurner, Comhined..J. F. Williams
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Barometric condenser.....E. G. Helander
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Bed, Folding.....J. Ranko
Bed-pan.....J. M. Crater
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.....P. N. Pecci
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Boats, Means for automatically releasing ships'
.....R. Archihald
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Boots and shoes, Eyelet for.....J. F. Chalk
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Bottle filling and capping machine.....
.....G. Kirkegaard
Bottle-holder.....R. C. D. Legg
Bottle, Non-refillahle.....T. W. Leonard
Bottle or receptacle, Collapsihle..L. P. Brown
Bottle-stopper.....E. Goldstein
Bottle, &c., stoppering device..L. B. Jones et al
Bottle-support and stopper-puller..M. A. Gould
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Boxes, Machine for applying fastening devices to.....C. O. Mason
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Brake-head.....S. J. Strid
Brake mechanism.....A. Larsen
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Buckle.....C. O. Anderson
Buggy-top support.....W. C. Putman
Bulkhead-doors, Mechanism for operating water-tight.....H. M. Gleason
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Button.....O. P. Talley
Button link or fastener.....E. B. Bayliss
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Cameras, Magazine plate-holder for photographic.....R. J. and J. A. London
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Can-marking device.....T. O. Matthews
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Cars, Tipple for coal-.....W. L. Hansen et al
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Card, Electrically-operated price-..P. L. Dirking
Carrier.....L. B. Larsen
Carrier system.....A. Swahn
Cartridge having multipart projectiles..G. Luger
Casting machine, Ingot-.....L. E. Howard
Centrifugal separator.....T. S. Patterson
Chafing-dish-lamp shutter.....E. D. Holley
Cheese-cover.....T. A. Thompson
Churn-operating means.....C. L. Archie
Circuit-controller.....W. L. Bliss
Circuit-controlling switch.....W. S. Ryan
Cistern, Air-tight.....B. L. Mills
Cistern, Siphon-discharge flushing-.....
.....J. W. Walls, Jr.
Clipper, Sheep-.....C. D. T. McQuoid
Clock-setting means, Alarm-.....W. A. Armour
Clock winding-indicator.....W. J. A. Mielke
Closet-seat humper.....J. Bropson
Clothes-line reel and tightener..R. M. Kneisley
Clothes-lines, &c., Holder for.....C. C. Gould
Clutch.....C. Schmidt
Clutch.....C. W. Hart
Cock, Stop-.....J. E. Van Nostran
Coffin-hox mold.....E. W. Ellington
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Comh stamping and cutting die..G. R. Farrell
Composition of matter.....F. D. Borland et al
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.....F. M. Talhot
Concrete walls, One-side mold for.....
.....J. H. Magdiel
Condenser, Electrolyte-.....I. Moscicki
Condenser, Steam-.....E. Koerting
Cooker, Fruit-hutter.....M. M. Chase
Cooking utensil.....I. Bauer
Corn-husking-machine separator attachment....
.....O. Boyer
Cotton-chopper.....W. S. and J. J. Pace
Coupling carry-iron.....B. P. Flory
Coupling-pin.....L. Huey
Coupling-pin lifter.....J. M. Arthur et al
Crack-filling device.....A. Murrie
Crate and coop, Folding.....W. A. Tomison
Crib structure.....J. B. Marshall
Current collector, Electric-..A. H. Angle et al
Curtain-fixture.....G. J. Johnson
Cushion-spring for vehicles, Upthrow.....
.....C. L. Thomas
Cycle, Motor-.....J. David
Damper and flue-ventilator.....A. R. Clark
Damper, Fireplace-.....D. B. Livesey
Damper-regulator, Thermostat...R. E. Dewey
Dental clamp.....H. S. Miller
Derrick.....F. Hunt
Designs and producing the same, Pattern-plate for reproducing.....J. Jacohson
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Display-stand, Jeweler's....M. Jersemann et al
Displaying device, Sign-.....W. S. Ryan
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.....V. Slavicek
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Door, Grain-.....W. Jordan
Door hanger and guide.....E. T. Rohinson
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.....A. Carpenter
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Electric conductors, Connection-terminal for..
.....H. G. Addie
Electric furnace.....J. Bouneau
Electric machine, Dynamo-.....L. J. Hunt
Electric machine, Dynamo-.....J. A. Williams
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Electric machine, Magneto-.....E. Troike
Electric outlet-hox.....C. J. Dorff
Electric switch, Pendent.....G. B. Thomas
Electrical circuit or circuits, Device for making an.....W. S. Ryan
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Electrolier holder or hanger.....J. C. Vogel
Electrotherapeutic apparatus.....B. Y. Boyd
Elevated carrier.....W. Nummedahl
Embossing and printing presses, Winding mechanism for.....C. E. Brooks
Endurance-testing machine.....H. Souther
Engine.....H. E. B. Blomgren
Engine igniter, Gasolene-.....
.....D. F. MacCarthy et al
Envelop.....W. E. Rickey
Envelop.....J. J. Tishler
Excavator and dredge, Twin-hoom adjustahle..
.....C. D. Camphell
Explosion-motor with rotating cylinders.....
.....H. Nielsen
Explosive-engine.....C. C. Coffey et al
Explosive-engine.....H. Greer, Jr.
Eyeglass-frame.....F. A. Marcher
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Farm-gate.....G. A. Manfull
Faucet.....J. B. Woodworth
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Feed-water heater and separator.....
.....W. S. Hallowell et al
Fence-post.....T. J. Akers et al
Fertilizer and seed distrihuter...O. Wingreen
File, Bill-.....A. H. Kelly
Fire-escape.....F. H. Lomhard
Fire-escape.....J. Luckett
Fire-extinguisher.....D. I. Garretson
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Floor-scraper.....A. T. and I. W. Beeler
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Fuel, Making artificial.....M. J. Yampolsky
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.....G. C. Shackleford
Furnace-grate.....E. Katzinger
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Garment-fastener.....B. L. Lewis
Garment-fastener.....C. D. Smith
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Gas generator, Automatic high-pressure acetylene-.....C. Woolley
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Gas-purifier.....C. Flössel
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.....E. G. B. Körting
Gas-retort furnace.....H. Ries
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.....M. Mayer et al
Gearing, Drive-.....N. Frye
Glass-drawing process and apparatus.....
.....J. H. Luhhers
Glazier's tahle.....W. B. Coshy
Grader and ditching-machine, Road-.....
.....J. M. Mock et al
Grain-hin.....W. S. Thompson
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Grater.....B. F. Hoffman
Greenhouse.....E. A. Holt
Grinding-machine.....F. N. Connet
Grinding-mill.....T. C. Cadwgan
Grinding-mill.....E. Utz
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Gun, Magazine air-.....J. H. Cox
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Hay-press.....D. S. Beard
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Heating apparatus, Gas.....T. B. Jarvies
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.....C. H. Smith et al
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.....D. W. Thornton et al
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Ice-pick.....M. H. Mann
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Ignition device, Electric, 2 pats...T. Huhert
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Incuhator-alarm.....P. S. Martin
Incuhator-thermometer holder..C. A. Cyphers
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.....A. Thoma
Innersoles, Manufacture of.....A. Thoma
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Internal-comhustion engine, Compound.....
.....S. A. Reeve
Iron products, Apparatus for hreaking and transporting.....A. C. Eastwood
Ironing, folding and shaping machine, Edge..
.....P. H. Larson
Jewelry-clasp.....A. J. Pollock
Journal-luhricator.....I. E. Farr
Key-retainer.....A. I. Jacohs
Kiln, &c., hurner, Cement-..W. H. Harding
Knitting-machine attachment, Circular-.....
.....H. H. West
Ladder.....I. R. Concoff et al
Ladder and ironing-hoard support, Combination step-.....A. Stevens
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Lamps, Mask for automohile-.H. D. Penney
Lamps, &c., Spring-catch for..H. E. Harhaugh
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Lighting system.....W. I. Thomson
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Loom-shuttle.....A. B. Edmands
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.....W. S. Morrison
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Mattress, Spring-.....H. Ackermann
Measure.....J. R. Carroll
Measurer, Lumher-.....W. B. Woodruff
Mechanical movement.....T. V. Buckwalter
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(*Continued in September Number.*)

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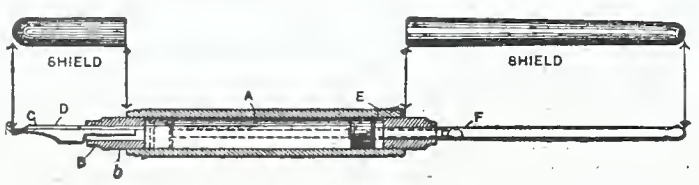
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THE WRIGHT AEROPLANE.

THE successful trials of the Wright aeroplane near this city during tbe past month, resulting in the formal purchase of the machine by the Government, and the dramatic crossing of the English channel by Bleriot which coincided with the experiments here, have again attracted public attention to airships. The thousands of people who traversed the hot and dusty miles that separate Fort Myer from Washington, and who waited patiently through hours for many evenings in succession, felt themselves more than rewarded by a sight of the final triumph. After many discouragements and accidents, the conquest of the air, not only by the dirigible balloon but by a machine that closely approximates the appearance and movement of a bird in flight is now an accomplished fact, and those spectators who came prepared to scoff, remained to cheer, as they watched the smooth and confident evolutions of the vessel in the air, soaring in any direction and at any height desired, crossing the country at the rate of over 40 miles an hour, carrying two passengers for more than an hour around the parade ground of the army station, and coming to rest on the earth as lightly as a butterfly, in the exact spot chosen by the aviator. There is no apparent reason, if a machine can do all this, why it cannot continue to work until the motor breaks down; and with an advance in the knowledge of aeronautics parallel to that which has characterized the last decade, it will not be many years before we have mail packets traversing the aerial ocean in all directions, and connecting us with Europe in a journey of three days.

The Chief of the Signal Service,



(Courtesy of H. A. Farnham, Photographer.)

FIG. 1.—MACHINE BEING TAKEN TO STARTING PLACE, SHOWING STEERING PLANE TO THE RIGHT.

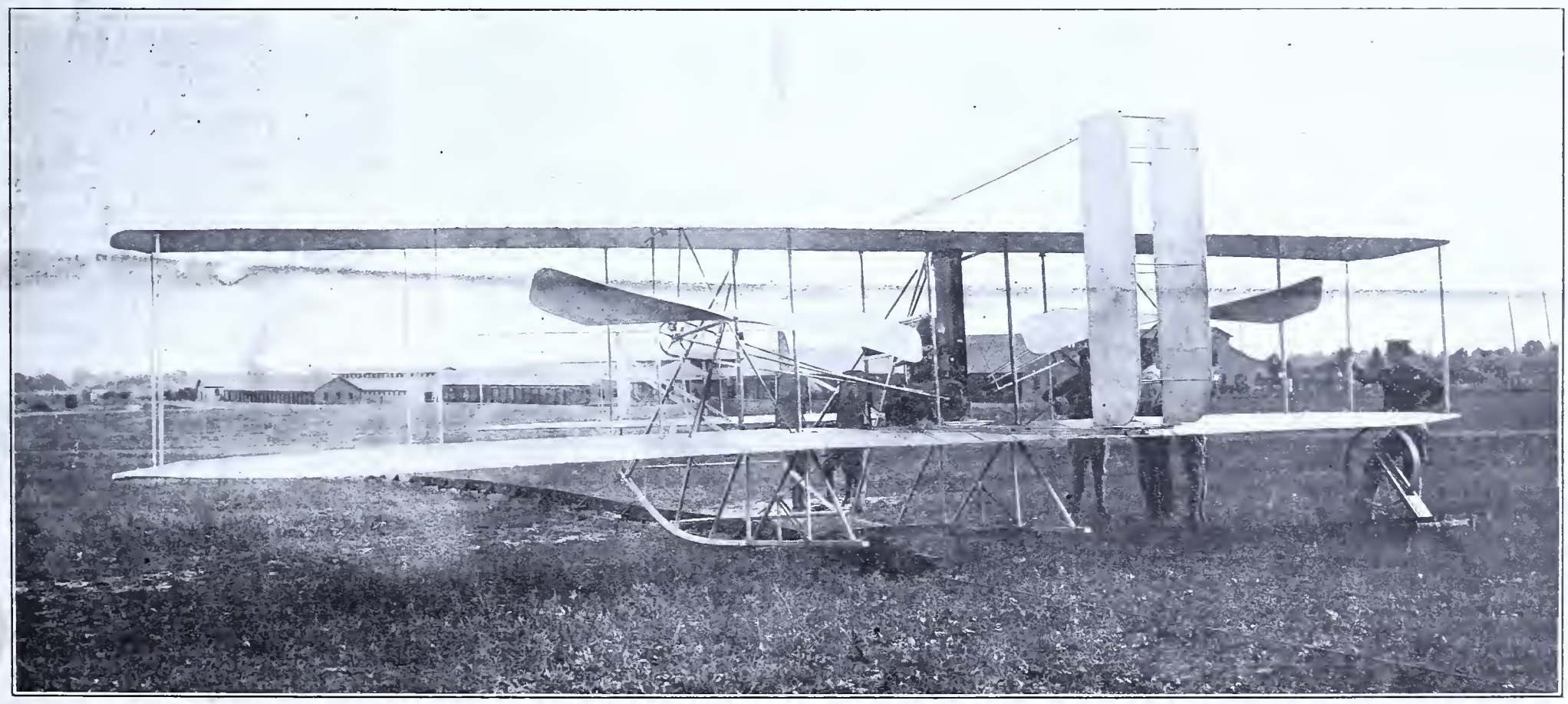


FIG. 2.—THE WRIGHT AEROPLANE IN THE STARTING POSITION.

Courtesy of H. A. Farnham, Photographer.)

having paid $25,000 to the Wright brothers for the machine that was so successful in the trials here, has arranged to have Wilbur Wright begin the instruction of officers in the art of flying. The Wrights have announced their intention of entering into the general manufacture of aeroplanes, which will be sold to the public at $7,500 each; and already several orders have been received. There is no reason, however, why persons who desire to fly should not follow the daring example set them by these young men, and make machines for themselves. The accompanying cuts give a complete idea of the construction of the apparatus, which is mainly remarkable for its extreme simplicity.

The machine comprises two parallel planes, spaced and held apart, and horizontally disposed as shown in figure 2, thus giving the machine the title of a "bi-plane," and distinguishing it from the single monoplane in which Bleriot crossed the channel. This view was taken on the parade ground at Fort Myer, Va., and shows the machine from the rear preparatory to a flight, the mono rail employed in starting the machine being clearly discernible thereunder.

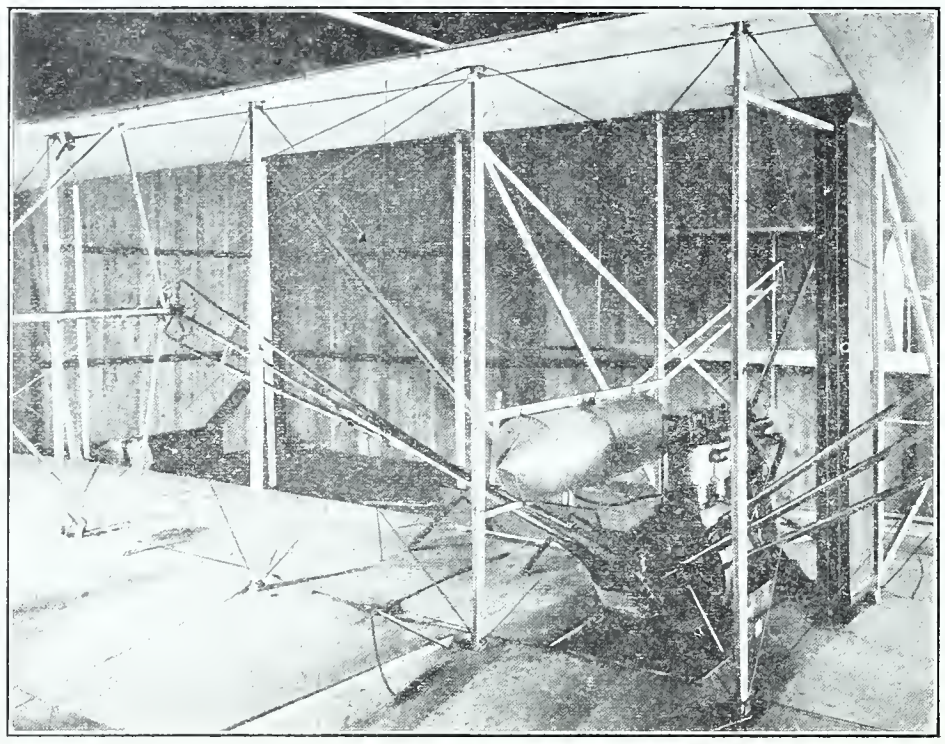
These planes are formed of a light, but strong textile material, and are concaved to form air-pockets. They are held together by very light wooden spars which are spaced apart at suitable intervals. Arranged between the planes and supported by proper means, is a gas engine which develops about one horse power for every pound of its weight. The fuel tank for the engine is shown between the operator's seat and the engine. Propeller shafts are placed respectively midway between the planes and at either side of the center. These shafts are braced and arranged in the rear of the machine, and are revolved in opposite directions by sprocket chains, which are partially covered by a piping in order to prevent anything coming in contact with them. (Fig. 3) The propeller blades are made of sheet aluminum, and each is about 8 inches in width and has a total length of 16 feet, the blades being of greater length than the distance between the two planes. Extending centrally and rearwardly from the planes are two rudder supporting arms, which are held stationary by suitable guy wires. The rudder is composed of two vertical and parallel strips of fabric mounted in frameworks, and pivotally supported between the ends of the said arms. (Fig. 2.) This two-part rudder moves in unison, either to the right or to the left, by means of a lever arranged in front and to one side of the operator's seat.

In order to direct the elevation of the machine, an ingenious type of steering-plane has been devised. (Fig. 1.) A series of forwardly extending arms, properly braced, are provided, and on the outer ends thereof is supported the steering-plane, which is really a miniature copy of the two main planes. These horizontal planes are upwardly or downwardly inclined as desired, by means of suitable levers extending to the operating lever beside the operator's seat. (Fig. 4.)

In order to give the machine sufficient momentum for starting, a mono-rail is employed. (Fig. 2.) The runners below the machine are connected by a transverse member which is positioned at its center on the said mono-rail. A weight (not shown) is supported by a suitable frame-work, and a cable extends from the weight down over a series of pulleys, under the rail to the farthest end, and then along the upper edge thereof to a push-block which is positioned on the rail behind the said transverse member. When the weight is dropped, the block is pulled forward, and the block necessarily moves the machine along the rail. Previous to the dropping of the weight, the engine is started and as soon as the propellers are "tuned up," the machine is started. Then by a slight inclination of the steering plane the machine will at once start "to climb."

Should the motor fail from any cause whatsoever, the steering plane can be so manipulated that the machine will glide to earth in a graceful manner, and without any danger to either machine or operator.

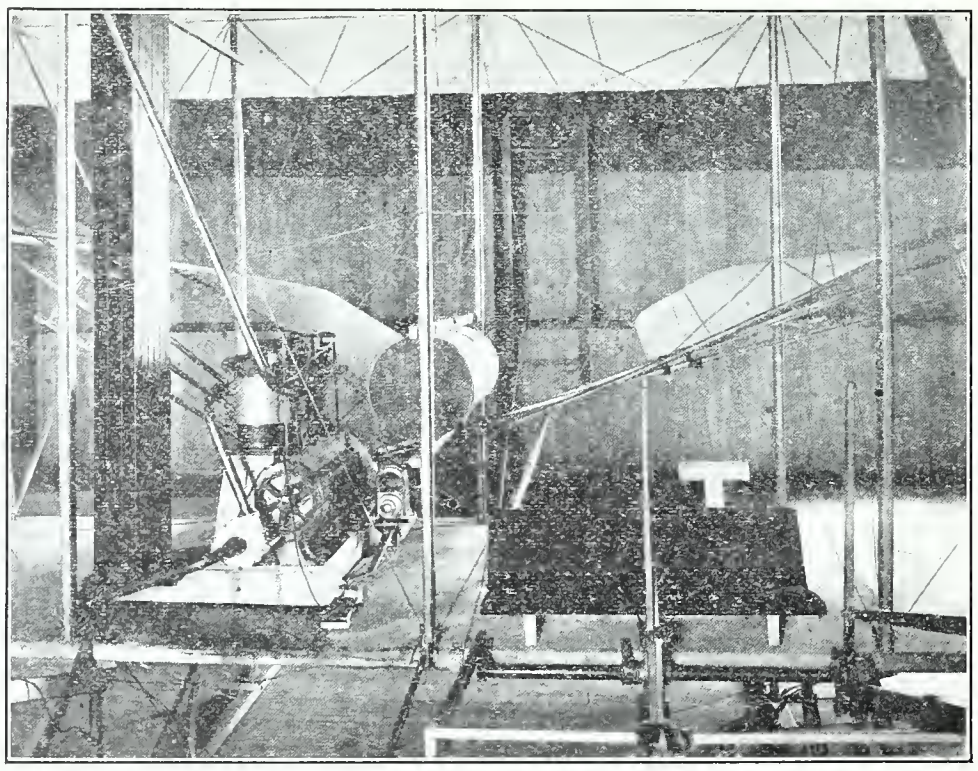
The machine has developed a speed of 45 miles per hour; has proved that it can (depending on the amount of fuel) fly indefinitely, and that at all times it is under the complete control of the operator, going up or down, to the right or to the left as the case may be.



(Courtesy of H. A. Farnham, Photographer.)

FIG. 3.—MOTOR AND GEARING FOR PROPELLERS.

Referring to the illustrations in detail, figure 2 which represents the machine from the rear, shows clearly the two planes, the two propellers, the rear rudder consisting of two blades arranged in a vertical position, and the runners which support the machine. The front steering plane is hardly discernible in this illustration. It is indicated distinctly in Figure 1, which represents the two Wright brothers taking the machine to the starting place. Figure 1 is an end view and shows the two planes, the rear rudder and the propellers to the left and the steering plane to the right.



(Courtesy of H. A. Farnham, Photographer.)

FIG. 4.—OPERATOR'S SEAT, OPERATING LEVERS, AND MOTOR.

Figures 3 and 4 show the interior mechanism. Figure 3 represents the engine and its necessary parts with the gearing connections for one of the the propeller shafts. The view shows to the left the end of the propeller shaft with a sprocket wheel thereon. Figure 4 is a front view and shows to the right the operator's seat and the operating levers, and to the left the motor and its necessary parts, the propellers being discernible in the rear.

Moving Platforms on Brooklyn Bridge.

Strap hanging in street cars and the general congestion of intraurban travel will be at an end if the invention of a New York man, who is backed by capitalists of that city, proves as successful as is anticipated. Attracted to the conditions at the Brooklyn Bridge, where during the rush hours the traction companies endeavor to transport 60,000 passengers an hour with facilities which 45,000 tax to the utmost, he evolved a scheme based to an extent on the moving sidewalk which was a feature of the pier at the World's Fair at Chicago. The idea is to equip the Brooklyn Bridge with a series of five moving platforms, one within another. The outer one would travel at the rate of three miles an hour, the second at six miles an hour, the third at nine and the fourth at twelve. The inner one, which he would operate at fifteen miles an hour, he would have equipped with seats each holding half dozen persons. To step from one platform to another while both were in motion would be safe and easy. With this system of platforms, moving in one direction on one side of the bridge and back on the other, the inventor claims he can transport 174,000 persons an hour.

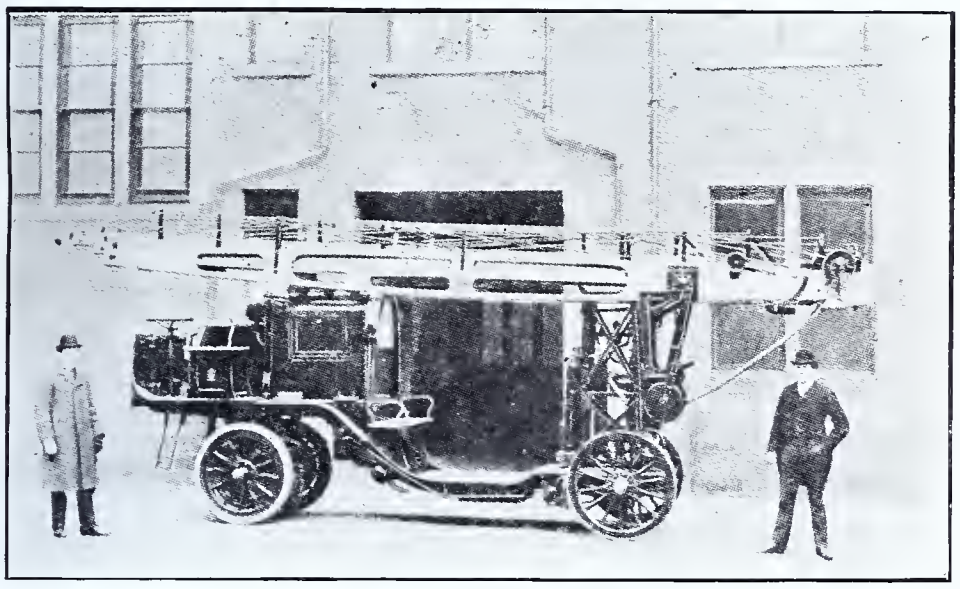
As an economical method of transportation, the promoters declare that there would be no motormen, conductors nor brakemen to pay, and that the expense for power, repairs and operating force would be less than for any other system that is in use today.

Floor Board Lifter.

Very often the removal of a floor board, to secure access to a pipe or an electric wire beneath, proves a troublesome task, especially if the board is swollen, when it proves very refractory. Invariably a withdrawal under these conditions ruins the board so that it cannot be relaid. Recently a convenient little tool has been devised, so small that it can be packed into any tool bag, which will lift the most obstinate board without cutting or splitting. The tool comprises a cross piece of metal which spans the board to be raised. This carries two small wood screws, while at either end is another small screw, fitted with a foot at the bottom and a small handle at the top, similar to a screw jack. All that is necessary is to place the tool across the board so that the extreme jack feet secure a purchase on the adjacent board on either side. The inner screws are then driven into the board, to be lifted by a screw hammer to secure a firm purchase. By twisting the two little jacks at either end, the bridge of the tool is raised bodily several inches, lifting the board with it. No damage is done to the board, and two little plugs will finish off the holes left by the screws. By electrical, gas and water engineers especially, it will be found most useful.

FIGHTING THE RED PLAGUE.

A recent publication by a building association casts a vivid light on the losses resulting from what is called the great red plague—fire—in our country. In a normal year, Uncle Sam loses about two hundred million dollars from fire, not counting the $150,000,000 that is spent in alleged fire protection and $196,000,000 more in insurance premiums. The tax upon the country yearly, therefore, by reason of fires is more than $500,000,000, or 70 per cent higher than in any other country. No wonder we have gained the unenviable title of "combustible America." This does not take into account such conflagrations as those of Baltimore in 1904 and San Francisco in 1906, when the evil was much enhanced. Our fire bill grows with the increase in our population and the expansion of the housing facilities. Not even the spectacular burning of Rome nor the great conflagration of ancient London, compares in extent with the vast destruction of property in the United States in a single year.



MOTOR FIRE ESCAPE READY FOR TRANSIT.

New devices for fire-fighting are constantly being introduced, and many are meritorious. The accompanying cut shows a motor-fire escape with an eighty-five feet extension ladder. The motive power is electric, a petrol engine driving a dynamo, which transmits its current to two electric motors on the front wheels. The car is therefore driven by the front and steering wheels. The ladders are raised and lowered by a carbonic acid gas engine.

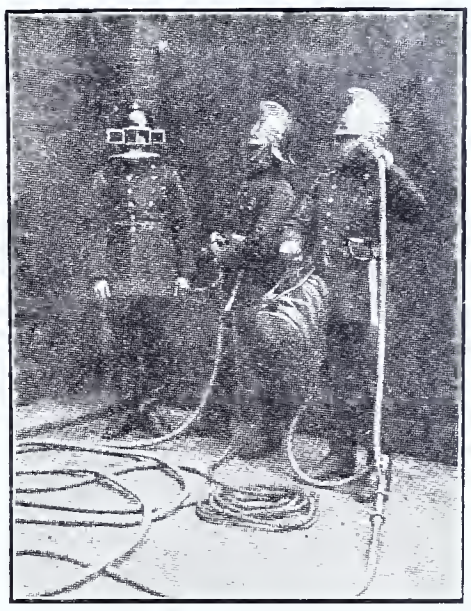
Another novelty shown herewith is a smoke helmet for firemen. With this apparatus the fireman receives a supply of air through a hose attached to the helmet, the air being pumped to him through a bellows-like pump, which is operated by one of the assistants. In the illustration, the assistant holds in his other hand a speaking tube which can be used in communication with the wearer of the helmet.

Since the terrible fire that came so near to destroying Baltimore, many new inventions for combating the perilous element have been adopted in that city. It is said, indeed, that very few fire departments are so well equipped. Among the novelties installed are a compressed air engine, that lifts the largest ladders in seven seconds; an electrical device for harnessing engine horses; another electrical apparatus for turning on all the lights in an engine house when an alarm is sounded. and for shutting them off automatically as soon as the engine has departed for the scene of the fire; and an acetylene searchlight that burns forty minutes, and serves to light dark cellars and smoked-filled rooms.

The latter may be reckoned as among the most ingenious of the minor innovations. It looks like a can, a foot high and some 6 inches in diameter; it holds about three pounds of acetylene carbide, which is of the same chemical nature as the material used to generate acetylene gas, the brilliant illuminating qualities of which are known. To use the searchlight, a hole is knocked in the top and water poured therein. Immediately there flares up a dazzling white blaze. No match is used, as combustion takes place spontaneously as soon as the gas generated by the water comes in contact with the air. The only drawback about the device is the odor, which resembles that of ancient eggs; but it is peculiarly useful in cellar fires, where darkness and smoke are encountered. It is easily portable, and by means of a reflector its rays can be directed wherever desired.

The chemical engine cannot be called altogether new, as it has been in service for years: but it has lately undergone improvement. In its present-day form it consists of a wagon on which are placed two tanks, containing bicarbonate of soda, sulphuric acid and water. These chemicals are not mixed until needed, and the act of mixing is accomplished in the machine in a simple manner. In the top of the tank is suspended a bottle, so arranged that by turning a screw the glass can be crushed. The bottle contains sulphuric acid, and the soda and water are in the tank. When the bottle is broken and the acid mingles with the soda, carbonic acid gas is generated, and when sufficient pressure is obtained, the mixture is turned upon the flames. In principle the engine is something like a seltzer syphon, and the gas contained in it is the same.

The efficacy of the chemical engine in extinguishing small fires has been tried and proved. It does less damage to property than water and is usually quicker in action. It is easily transported and needs the services of only two men.



HELMET FOR FIREMEN.

Still newer is the compressed air lift for the ladders of truck wagons. By means of this, the longest of these long shafts can be raised upright in seven seconds. The apparatus, which is of extreme simplicity, consists of two piston tanks and one cylinder of air. The pistons are connected with the ladders by an apparatus which utilizes the power of leverage in its operation. When it is desired to use the machine, the operator turns a stopcock which allows the air from the cylinder to rush into the piston tanks. The long ladders then arise smoothly and quickly.



THE LADDER EXTENDED.

The other mechanical devices mentioned are likewise improvements on old apparatus. One is an invention which supplants by electro-magnet the clumsy weight apparatus formerly in use at fire stations for lowering harness and unhitching horses upon the sounding of a fire alarm. It is automatic and more reliable than the old arrangement. The light trip has the object of switching on the lights in an engine house at night when an alarm sounds. By the old method this was accomplished by a wooden rod and a tank of glycerin. The new device is composed of clock wheels that start to run at the beginning of a fire alarm and regulate the flow of the current they control to any desired length of time. Climatic disturbances have no influence upon it—as was the case with glycerin—so that it very satisfactorily fulfills its purpose.

Electricity in Agriculture.

Artificial light has come to play a vital part not only in the treatment of disease, but in agriculture. For nearly a third of a century the world has known that fruit and vegetables could be brought to perfection under the rays of an electric light; and it has later been proved that not only the flowers but the roots of plants could be powerfully stimulated by the electric current. Further experiments have demonstrated that the beams from an arc lamp form a real substitute for sunlight. Under this new system, says the *World's Work*, the productiveness of the plant is enormously increased, especially during the winter months. The production in November and December is increased four and eight times, respectively. The significance of this cannot be gainsaid, for under this system the grower is placed practically on the same footing as his envied competitor in California. Should these rosy expectations be realized in actual practice, the prospect opened is alluring. In fact, something like a millenium in the horticultural world would have been reached.

The chief characteristic of the new plan, for which credit is due to Mr. Thwait, a civil engineer, is its extreme simplicity, as well as its practicability. It appears that the feeding, heating and lighting of the plants are all accomplished by means of a gas engine. A water-jacket on the engine provides the heat, and the perfect illumination of each part of every plant is secured by the aid of an arc lamp, which is slowly moved all around the glass-house and can be placed in any position. The cost of heating by this plan is claimed to be much less than by the ordinary furnace and boiler.

In this connection, it may be noted that experiments with growing plants under colored lights have yielded curious results. In red light, flowers flourished exceedingly and outstripped their contemporaries. Under blue light, plants make no appreciable growth. It is also found possible to change the color, shape and size of the leaves by varying the rays of the spectrum that illuminate them. The production of perfume can also be considerably increased by colored rays. Radio-culture, as this system of horticulture under colored glass is called, is still in the experimental stage; but it already suggests the building of the red glass houses for forcing, as the light itself will supply stimulus without additional heating and manuring.

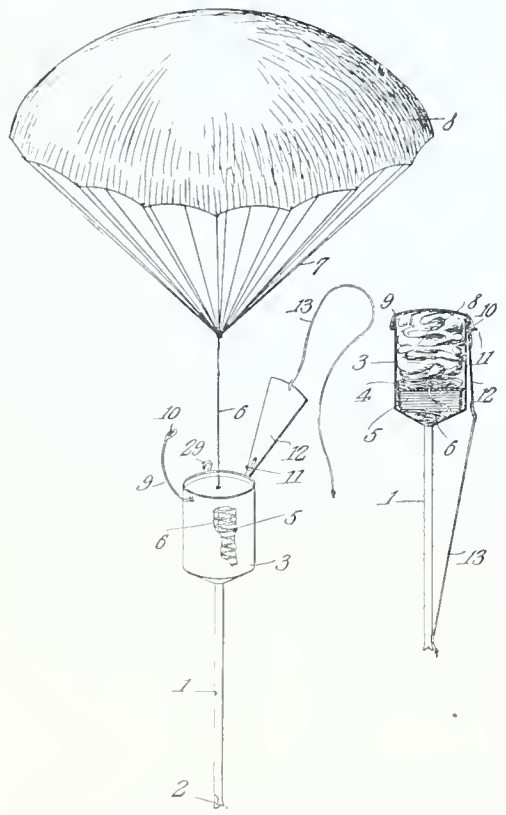
CLEVER NEW PATENTS.

Aerial Toy.—Strainer for Sinks.—
Folding Bed.—Milking Machine.

Aerial Toy.

A very ingenious toy has been recently patented by Jackson W. Foster, Jacksonville, Fla., assignor of one half interest to Alexander Sabel, of the same place.

The object of this invention is to provide a projectile preferably of that type designed to be shot after the manner of an arrow, although of course, the same may be discbarged from a specially constructed rifle if so desired.

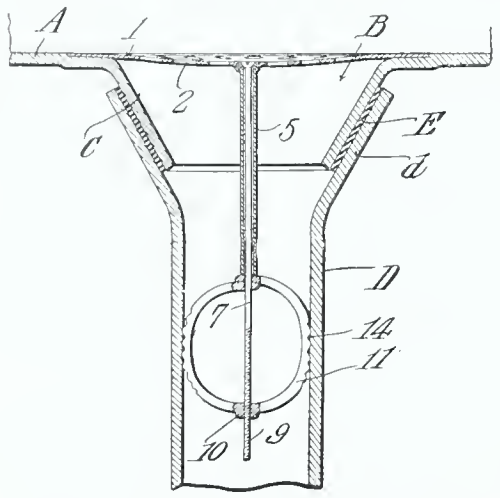


In the accompanying illustration, the figure on the left sbows a projectile embodying the improvement, said device having the form of a parachute. The small figure sbows a sectional view tbrough the head of a projectile, and also the position of the parachute locked within the head. The invention comprises a stem or shaft 1 which is preferably notched at one end as indicated at 2 so as to properly engage the string of a bow for use in sbooting the projectile. A head 3 is arranged on the other end of the stem and is preferably in the form of a hollow cylinder wbich is open at its outer end. A disk 4 is movably mounted witbin the head and bears upon one end of a helical spring 5. A cord or other flexible device 6 is secured at one end to the inner end or bottom of the head 3, passes through the spring 5 on the center of tbe disk 4 and is attached to the cords 7 of tbe parachute 8. A retaining bar 9 is pivotally connected to the head and is designed to swing across said open end thereof and retain the folded parachute therein, as shown by the smaller illustration. An eye 10 is formed on the free end of the bar 9 and is designed to be engaged by a lug 11 outstanding from the wing 12 which is hingedly connected to the head. Wben the projectile is not in use, a cord 13 which is fastened to the free end of the wing 12 may be fastened to the stem or shaft 1 close to the notched end 2 thereof. In using the device, the cord 13 is unfastened from the shaft and is held by the operator so as to maintain the wing 12 in its depressed position. The stem is placed in engagement with the string of a bow and the projectile may then be shot like an arrow, the operator of course releasing the cord 13 at the same instant the projectile is released. As soon as the projectile reaches the limit of its upward movement and begins to descend, the wing being relieved of the air pressure to which it was subjected during the upward flght of the projectile, will be swung upwardly by the spring 5 and the folded parachute will be promptly expelled from the head. The device will then, as will be readily apparent, gradually descend to the ground in the form of a miniature parachute.

Strainer for Sinks.

An improved means for securing strainers in sinks, is the subject-matter of a patent recently obtained by John F. Sullivan, of Carbondale, Pa. Heretofore, it has been customary to employ one or more bolts or screws for fastening the strainer in position. The object of this invention is to provide a simple and efficient means for securing a strainer in position, the said means being designed to frictionally engage the drain pipe and being readily adjustable so as to properly engage pipes of different diameters.

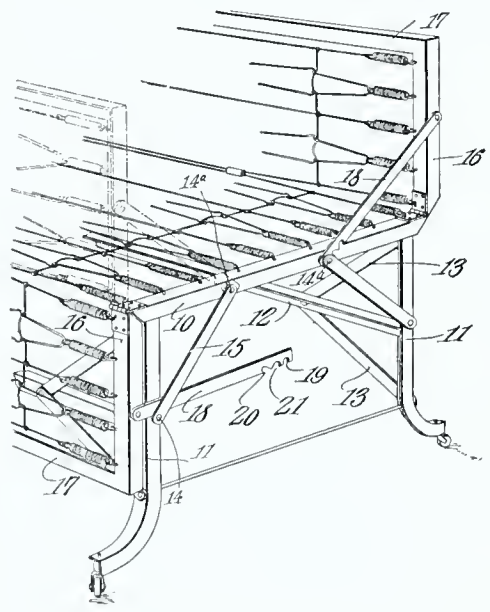
Referring to the accompanying illustration, it will be observed that *A* designates a portion of a sink baving an outlet opening *B* whicb is surrounded by a downwardly extending flange *C*. The said flange extends into the flared end of a drain pipe *D*, and is also provided with a washer *E* which is arranged between the said end *d* and the flange *C*. The plate or drainer 1 of the strainer is provided with a plurality of openings 2. Depending from tbe center of tbe strainer is a tubular hanger 5 and extending longitudinally from the said hanger is an elongated screw 7, the head 8 of which is designed to rest upon the strainer 1. The other end of tbe screw is threaded as indicated at 9, and extends through a nut 10 having oppositely extending bowed or arcuate arms 11 integral therewith. The outer or convex faces of the arms or jaws 11 are roughened as shown at 14.



From the foregoing, it will be readily apparent that by the turning of the screw 7, the arms 11 will be extended and the roughened faces 14 tbereof will be forced into engagement with the interior of the drain pipe *D*, the contact of the arms with the drain pipe readily holding the strainer in a tight relation with the sink, and yet permitting the strainer to be readily disengaged whenever it is desired.

Folding Bed.

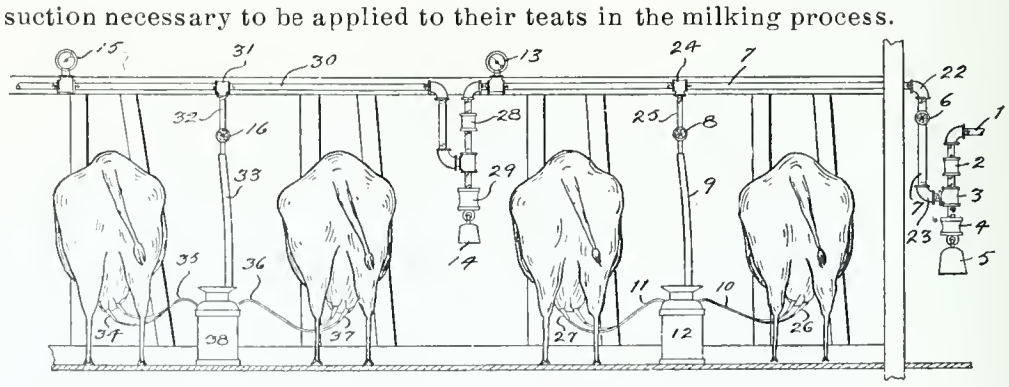
F. J. Crouch, of Seattle, Washington, has recently been granted letters-patent for an improvement in folding beds, the construction thereof permitting the same to be used as a single bed or couch, a three-quarters bed, a double bed, and a davenport or crib.



It is tbe aim of the invention to provide an improved means, whereby the said bed may be readily changed to and braced in any one of the above-described positions. As shown by the accompanying illustration, the invention comprises a frame having end rails 10 to wbich are attached legs 11 and side rails 12. Collar pins 14*a*–14*a* are carried by the end rails 10 and are adapted to be respectively engaged by the braces 15 which are pivoted to the legs 11 by the pins 14. Hinged to the member 10 and preferably at each end thereof, are auxiliary side supports or frames comprising end rails 16 and side rails 17, and pivotally connected to the said end rails 16 are brace bars 18, the free ends thereof being each provided with a slot 19. Adjacent the said slot 19 are slots 20 and 21, the said slots being respectively inclined in opposite directions. When it is desired to utilize the same bed as a crib, the said side frames are swung upwardly to a vertical position as shown by the dotted lines in the illustration, and the bar 18 engages the collar pin 14*a* by means of the slot 19. Should it be desired to form a three-quarters bed, one of the side frames is swung upwardly to a horizontal position, and the bars 18 are then respectively engaged with the collar pins 14 which are carried by the legs 11. When both of the side frames are in a horizontal position a double bed is provided.

Milking Machine.

Joseph H. Hoover, of Waterloo, Ia. is the patentee of an improved milking machine of considerable merit. The principal objects of the invention are first, to provide means for producing a constant tendency to a vacuum in the teat-cup of a milking machine, and second, to so adapt such means that the degree of vacuum may be varied at will, whereby two or more such machines may be connected in series, with the degree of vacuum in the different machines varying from each other in extent, as may be predetermined, to cause them to be respectively effective in milking cows which may differ in tbe amount of suction necessary to be applied to their teats in the milking process.



The accompanying illustration shows two of the milking machines connected in series and as applied to the teats of cows in the process of milking. Each of the machines is adapted for the milking of two cows. Referring to the figure at the right the teat-cups 26 and 27 lead by means of short hose connections 10 and 11 respectively to a closed air-exhausted receptacle 12. In the event tbat but one machine is employed, the receptacle 12 is placed in communication with a horizonal pipe 7 by means of the connection 9, an inserted pipe 25 provided with a stop-cock 8, and a coupling 24. Tbe pipe 7 is placed in communication witb a valve chamber 2 by means of an elbow 22, a pipe 7 containing a stop-cock 6, an elbow 23, and a coupling 3. The pipe 1 connects with a suitable pump (not shown) for exhausting the air. The degree of exhaustion of air is regulated by a weight 5 as desired. With eacb pair of connections a regulator weight is provided.

Thus it will be readily apparent tbat a herd of cattle, members of which are sensitive to more than a certain small pressure, simultaneously with other members which must have a greater pressure supplied, may be quickly milked.

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LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

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SMITH & HEMENWAY CO. v. E. C. STEARNS & CO.

(Circuit Court, N. D. New York. March 30, 1908. 160 F. R. p. 494.)

PATENTS—INFRINGEMENT—MITER-BOX.

The Seavey patent, No. 622,190, for a sawguide for sawing material for forming miter-joints, if conceded validity is not in any sense a pioneer patent, but is merely for an improvement in details of construction of the miter-boxes of the prior art, and is limited by the aetiou of the Patent Office to the precise combination shown and described, without any range of equivalents, and the patentee having expressly limited himself to a device with the "two-part slotted standard hinged to the bed outside of the line of the inner face of the bed" the patent is not infringed by the device of the Potter patent, No. 867,927, in which the hinge is located inside of the inner face of the bed, although in all other respects such device is a substantial eopy of that of the patent.

MILLER v. WHITNEY GLASS WORKS.

(Circuit Court, D. New Jersey. April 6, 1908. 160 F. R. p. 501.)

PATENTS—SUIT FOR INFRINGEMENT—ESTOPPEL.

Defendaut purchased from complainant and his associates in business four machines, mauufactured by them and designed by complainant. Before doing so it asked for a guaranty that the machines were not infringements of any patent, and in reply received a letter from the makers, written by one of complainant's associates in the business, assuring it that they were constructed entirely on the principles covered by certain expired patents, and that there was no danger that they infringed on other patents. After receiving the machines, defendant constructed and used another substantially like them. After the sale was made, and three of the machines had been delivered and installed, complainant applied for and subsequently obtained a patent thereon. Held, that complainant was not eutitled to maintain a suit in equity for infringement on aceount of the use by defendant of the machine it constructed, at least before notice to defendant of the infringement, nor without proof that it was used after such notice.

CLARK v. GEORGE LAWRENCE CO.

(Circuit Court, D. Oregon. April 6, 1908. 160 F. R. p. 512.)

1. PATENTS — NOVELTY — BURDEN AND MEASURE OF PROOF.

A patent duly issued is presumptively valid, and one attacking it for want of novelty has the burden of proof; and, if oral evidence is relied on, the proof must be clear, satisfactory, and beyond a reasonable doubt.

2. SAME — INFRINGEMENT — BUCKING ROLL FOR SADDLE.

The Clark patent, No. 674,757, for a bucking roll for attachment to a saddle, to preveut the rider from being thrown against the front part of the saddle, was not anticipated, and discloses novelty and invention; also held infriuged.

EMPIRE CREAM SEPARATOR CO. et al. v. SEARS, ROEBUCK & CO.

(Circuit Court of Appeals, Second Circuit. April 4, 1908. 160 F. R. p. 668.)

PATENTS—INFRINGEMENT — CREAM SEPARATORS.

The Anderson patent, No. 555,893, for an improvement in centrifugal cream separators, which consists essentially in the use of an eccentrically pierced rotable plug through which the cream flows after being separated from the milk, was not anticipated, and discloses invention, but is restricted by the prior art within very narrow limits. As so construed held infringed by one device used by defendant, but not by others.

DAIMLER MFG. CO. et al. v. CONKLIN.

(Circuit Court, S. D. New York. April 30, 1908. 160 F. R. p. 679.)

PATENTS—INFRINGEMENT-USE OF ARTICLES PURCHASED IN A FOREIGN COUNTRY.

A citizen of the United States, who, being in a foreign country, there purchases, solely for his personal use, an article protected in the United States by a patent granted to an assignee of the inventor, which the maker and seller in the foreign country had the right from the inventor to there make and sell, does not become an infringer of the United States patent by bringing such artiele home with him and using it here personally, and not for commercial purposes or profit.

EISENSTEIN v. FIBIGER.

(Cireuit Court, D. New Jersey. April 13, 1908. 160 F. R. p. 686.)

PATENTS — INVENTION—METHOD OF FINISHING CASES.

The Eisenstein patent, No. 795,505, for a method of finishing canes of bamboo tonquin, and reed, by coating them with a baking varnish paint and subjecting them to a temperature of 200 to 300 degrees as set forth in one claim and 240 to 300 degrees in the other for not less than three hours, is void, both because the limits of temperature stated are so wide apart as to be misleading and impracticable, and for lack of invention, the process being the same as that previously used in japanning articles of different material.

A. B. DICK CO. v HENRY et al.

(Circuit Court, S. D. New York. March 23, 1908. 160 F. R. p. 690.)

PATENTS—VALIDITY—PROCESS FOR DUPLICATING TYPEWRITTEN WORK.

The Dick patent, No. 466,537, for a process of duplicating typewritten work, which consists of introducing into a typewriter a stencil sheet, coated with wax or similar material, with other sheets in front and rear of it and after the typed impressions have been made thereon, peeling off the outer sheets, and with them the adhering wax where the types have struck so that the middle sheet may be used as a stencil for duplicating the typewriting, is void in view of the patent to Fuerth who was adjudged priority over Dick as the inventor of the combination of the three sheets so used, leaving only the function of work of the typewrittten machiue to be covered by the Dick patent, which is not a patentable process.

LEONA GARMENT CO. v. JENKS et al.

(Circuit Court, N. D. Illinois, E. D. June 5, 1907. 160 F. R. p. 693.)

PATENTS — INFRINGEMENT — LADIES' GARMENT.

The Critcher patent, No. 781,655, for a combined skirt and drawers, held valid and infringed by one style of garmeut made and sold by defendant, but narrowly construed as required by the prior art, not infringed by other and different styles.

WEED et al. v. GAY et al.

(Circuit Court, D. Connecticut. May 4, 1908. 160 F. R. p. 695.)

PATENTS—SUIT FOR INFRINGEMENT—PLEADING.

A bill for infringement of a patent and for unfair competition in trade construed, and held good on demurrer, and not multifarious.

WALTER BAKER & CO., Limited. v. DELAPHENHA et al.

(Circuit Court, D. New Jersey. April 13, 1908. 160 F. R. p. 726.)

1. TRADE-MARKS AND TRADE-NAMES-RIGHT TO TRADE-MARK—USER.

A manufacturer can acquire the right to a trade-mark only by its use on goods sold.

2. SAME—FOREIGN TRADE-MARK—NECESSITY OF USE IN THE UNITED STATES.

A foreigner can acquire the right to a common-law trade-mark in the United States only by its use on goods sold in this country.

3. SAME—LENGTH OF USE.

The right to a trade-mark does not depend upon any particular period of use, but once it is adopted in good faith and used, the right thereto inures, and will prevail against any subsequent user.

4. SAME—INFRINGEMENT— ISSUES IN SUIT FOR INFRINGEMENT.

In a technical trade-mark case, questions of deception, confusion, or injury are unimportant

5. SAME—TRADE-MARK FOR CHOCOLATE.

Complainant's registered trade-marks of the word "Auto" and a picture of a motor car, both for use on packages of chocolate, held infringed by defendants by the use of both the word and a picture of an automobile on packages of imported chocolate of similar kind, although of somewhat different style and coloring, and although the design was registered as a trade-mark in Switzerland before its use by complainant, where it was not until afterward used on goods sold in this country.

ROWLEY v. J. F. ROWLEY CO.

(Circuit Court of Appeals, Third Circuit. May 1, 1908. 161 F. R. p. 94.)

1. TRADE-NAMES—USE OF NAME—FRAUD.

While every man is entitled to his own name in connection with his business, equity will not permit its use in such a manner as to perpetrate a fraud.

2. SAME—INJUNCTION—SCOPE OF RELIEF—EXPLANATORY DESCRIPTION.

Complainant's president, having built up a business in the manufacture of artificial legs under his own name, which were widely known as "Rowley" legs, transferred his business and good will to complainant, after which defendant, whose name was also Rowley, embarked in the same business, and advertised himself as manufacturing "Rowley" artificial legs. Held, that an injunctiou restraining defendant from any use of the name "Rowley" in the manufacture of artificial limbs was too broad, and should have been limited to the use of the name without some explanaton which would prevent deception.

STAFFORD et al. v. MORRIS et al.

(Circuit Court, N. D. New York. April 11, 1908. 161 F. R. p. 113)

1. PATENTS — INFRINGEMENT — CIRCULAR-KNITTING MACHINE.

The Stafford and Holt patent, No. 759,928, for improvements in circular-knitting machines by which each swinging throat cam is independently moved while the machine is at work by its separate pattern chain for the purpose of produciug fabrics of a large variety of patterns and stitches, was uot anticipated, and, while covering a combination of old elements, discloses patentable invention; the combination being new with a uew mode of operation and producing a new and useful result. Also held infringed.

2. SAME—INVENTION—EVIDENCE OF INVENTION.

The fact that the product of a machine made by a new combination of old elements goes into general use and displaces others is some evidence, of greater or less weight, that the new combination involved invention.

LAAS et al. v. SCOTT et al.

(Circuit Court, E. D. Wisconsiu. April 2, 1908. 161 F. R. p. 122.)

1. PATENTS—SUIT IN EQUITY TO OBTAIN PATENT—PRESUMPTION FROM REFUSAL.

In a suit under Rev. St. § 4915 (U. S. Comp. St. 1901, p. 3392), to obtain the issuance of a patent denied by the Patent Office and the Court of Appeals of the District of Columbia after a hearing in interference between the same parties, the decisions of such tribuuals adjudging priority of invention to the defendant, are presumptively correct only, and that presumption is destroyed by proof that they were based on false and perjured evidence.

2. SAME—PERSONS ENTITLED TO PATENT—PRIORITY OF INVENTION.

Under our patent system, he who first arrives at a complete conception of an iuventiou is entitled to a patent therefor, unless the interest of the public is compromised by his lack of diligence in demonstrating that his invention is capable of useful operation. As between two inventors of the same thing, the one who first reduces the discovery to practical operation is deemed prima facie the true inventor without regard to the date of his conception, but the earlier inventor may overcome such presumption by satisfactory evidence that he used due diligence to perfect and utilize the invention, and actual reduction to practice is preferable to that which is coustructive merely.

3. SAME—REDUCTION TO PRACTICE.

When the inventor who is first to conceive is also the first to reduce to practice within the statutory period, he is entitled to priority, although a junior inventor may anticipate him by an earlier application for a patent, and may have secured such patent.

4. SAME.

In reducing an invention to practice, it is not necessary to prolong the test until its commercial value has been established, but, if it accomplishes the end desired, it is a perfected invention, although it may prove of little or no commercial value.

5. SAME—PERSON ENTITLED TO PATENT—RAIL ANCHOR.

Priority of invention of the device covered by the Laas and Sponenberg patent, No. 757,754, for a rail anchor or anti-creeper, designed to prevent the longitudinal movement of the rails of a railroad track, adjudged in favor of defendant John M. Scott, on evidence shown that he was not only the first to conceive the invention, but also the first to reduce it to practice.

DULL v. REYNOLDS ELECTRIC FLASHER MFG. CO. et al.

(Circuit Court, N. D. Illinois, E. D. April 22, 1908. 161 F. R. p. 129.)

PATENTS—SUIT FOR INFRINGEMENT—ESTOPPEL.

The sale by a partner to his copartner of his interest in the firm, without warranty, does not estop him, on subsequently acquiring a patent covering articles of the kind manufactured by the firm, to maintain a suit against his former partner for infringement not committed duriug the partnership term.

STERNBERG MFG. CO. v. MILLER, DU BRUL & PETERS MFG. CO.

(Circuit Court of Appeals, Eighth Circuit. April 11, 1908. 161 F. R. p. 318.)

TRADE-MARKS AND TRADE-NAMES—NAME USED TO DESIGNATE PATENTED ARTICLE —EFFECT OF EXPIRATION OF PATENT.

Where complainant manufactured and sold a cigar mold under a patent, and adopted the name "Vertical Top" to designate such mold alone in its literature, catalogues, etc., which it used during the life of the pateut, on its expiration the name, as well as the article, became free to the public, and complainant could not perpetuate its exclusive right thereto by registering it as a trade-mark.

CONSOLIDATED RY. ELECTRIC LIGHTING & EQUIPMENT CO. v. ADAMS & WESTLAKE CO.

(Circuit Court of Appeals, Seventh Circuit. Jan. 7, 1908. 161 F. R. p. 343.)

PATENTS—PRIORITY OF INVENTION-BURDEN OF PROOF ON ISSUE.

The grant of a patent raises a presumption that the patentee was the original inventor of the thing patented, and that inventiou was made at the time the applicatiou was filed, and one claimiug priority of invention has the burden of proving, by evidence which is clear aud certain, that the invention was conceived and reduced to practice by another prior to the date of the application. When such proof is made, however, the burden is shifted to the claimant under the patent to establish, if not with equal certainty, at least to the satisfactiou of the court, a still earlier date of invention by the patentee.

BLAIR et al v. JEANNETTE-McKEE GLASS WORKS.

(Circuit Court, W. D. Pennsylvania. April 10, 1908. 161 F. R. p. 355.)

1. PATENTS-SUIT FOR INFRINGEMENT-VIOLATION OF INJUNCTION—PROCEEDINGS FOR CONTEMPT—NEW CHARACTER OF INFRINGEMENT.

Where a defendant has been enjoined geuerally from infringing a patent, it is incumbent on him, not only to cease the iufringement then practiced, but to be careful to avoid other infringement; and where he immediately enters upou a different practice, which the court holds also infringes, he is guilty of a real contempt of court, and will be treated accordingly.

2. SAME—DEFINITION OF TERM IN PATENT—"PLASTIC."

Where a term is defiued in a patent, that is the construction to be given it, rather than the definition found in the dictionaries; and held, therefore, in a patent for the interior fire-finishiug of the glass article which provides that it is to be subject to the fire blast when in a "plastic" condition, by this term according to the patent is meant before the imperfections imparted to the inner surface of the mold by the plunger have become permanent by the formation of a glaze

MECHANICAL INVENTIONS AND DESIGNS.

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Theodore I. Grove, Hartland, Minn. Jar Cover.—This invention relates to an improvement in jar closures, and is particularly adapted for use on butter jars, although the closure may be applied to various other receptacles. One of the objects of the invention is to provide a cover having a handle, which will permit of the jaw being carried by said handle, the cover having means for readily locking it to or unlocking it from the jar.

Harry C. Stickel, Star Junction, Pa. Track Fastening.—An object of the present invention is to provide a metallic cross tie, equipped with means for fastening the various rails employed in track construction, and adapted to securely hold the same without the use of spikes, and capable of dispensing with the bolts usually employed in rail joints. Another object of the invention is to provide a metallic cross tie adapted to firmly grip the ballast, whereby the cross tie will be prevented from slipping longitudinally or transversely.

Charles F. Shepherd, Springfield, Mo. Printing Device.—This invention is primarily intended for printing cards, tags and the like, and has for its principal object to provide a novel, simple and practical machine in which names, addresses and the like can be readily and accurately set up and printed, and thus for instance, tags and labels can be plainly addressed, obviating the trouble of illegible addresses and the consequent confusion, delays and loss incident thereto.

Walter S. Gilson, Chicago, Illinois. Trunk Tray Form.—An object of the present invention is to provide a trunk tray form, adapted to facilitate the assembling of the several parts of a trunk, and capable of accurately and firmly holding the ends and partitions of trunk trays while the front and back strips are being fastened. Another object of the invention is to provide a trunk tray form which will be adjustable to accommodate trunk trays of different sizes, and will fit the various shapes of the angular front portions of the same.

John W. Trader, Jr., Sedalia, Mo. Wireless Check Row Attachment for Corn Planters.—An object of the present invention is to provide a check row attachment, adapted to be readily applied to various makes and styles of corn planters, and designed to obviate the many inconveniences resulting from the use of a wire, and susceptible also of adjustment for dropping the corn at the desired intervals. Another object of the invention is to provide a check row attachment, which will enable corn to be evenly checked on all kinds of ground, and which, should the planter get out of check at any time by reason of its traveling over uneven ground and other bad places, will admit of its being readily re-positioned in proper check at any point between the ends of the row.

Jacob Welty, Ashland, O. Device for Assisting Threading of Needles.—The object of the present invention is to provide a needle threading device, designed to be sold as an attachment for, and adapted to be readily applied to, the various makes of sewing machines, and capable of enabling the same to be conveniently threaded in poorly lighted rooms by throwing the light directly upon the eye of the needle. Another object of the invention is to provide means for adjustably securing the device to the presser bar of a sewing machine, and to enable the device, when not in use, to be arranged out of the way and to be quickly brought into position for assisting the threading of the needle when desired.

Lewis H. Bowman, Los Angeles, Cal. Track Fastening Device.—An object of the present invention is to provide a track fastening device, designed for use on wooden cross ties, and capable of effectually preventing the rails from spreading under the heaviest engines, and of thereby avoiding the wrecks incident to the spreading of rails. Another object of the invention is to provide a track fastening device arranged to protect a wooden cross tie, and adapted to materially increase the life of the latter, and capable of securely holding the rails, even should the cross ties rock at the ends.

John Pappa, Demorest, Ga. Broom Shield.—The present invention is designed to provide a broom shield adapted to be readily applied to, and removed from, a broom, so that after a broom has been worn the shield may be readily transferred to a new broom. The invention also has for its object to provide a broom shield, constructed to yieldably clamp a broom at opposite sides below the bulged upper portion of the broom head, whereby the shield will be retained in place on a broom without employing fastening devices.

Waldo H. Lowe, Urbana, Ohio. Combination Rack and Table.—An object of this invention is to provide a combination table and rack, designed for holding and displaying ready-made garments, and adapted to be arranged within the space occupied by an ordinary table, and capable of enabling the coats of suits to be conveniently arranged on hangers, whereby they may be more advantageously displayed than with an ordinary table, in which coats are arranged in piles and which permits only a small portion of each coat to be seen. Another object of the invention is to provide a combination table and rack having a top adapted to receive the trousers and vest, and capable of being readily removed for transferring its contents from one place to another without interfering with the coats.

Adolf Fromherz, Corvallis, Oregon. Log Guide for Log Skids.—An object of this invention is to provide a log guide, designed for use at curves and at the high and low places of log skids, and adapted to effect a great saving in time, labor and expense in handling logs at lumber camps, by enabling logs to slide freely along the skids and follow the cables at such curves and high and low places, whereby the logs will be prevented from either tearing up the skid, or catching the trees and breaking the cable.

David James, Coffeyville, Kansas, inventor; James F. Keefauver, same place, assignee of part interest of one patent. Gate and Music Leaf Turner. Two patents.—The first patent relates to a gate, equipped with gate and latch actuating means in which the tautness of the cable or draft connections between the actuating device and the gate will not vary during the swinging movement of the latter, and in which a positive latching of the gate in both its open and closed position will be effected without regard to the speed at which the gate is moved, thereby obviating the danger of the gate rebounding and consequently being left unlatched.

The second patent covers a novel music leaf turner, adapted to enable a plurality of sheets or pages to be successively and accurately turned, and equipped with means for clamping such sheets or pages to form a temporary binder for the same and to enable the leaf-turning mechanism to be readily transferred from one side of the sheet or page to another, so that any of the contents of the music leaf turner may be quickly arranged for use.

Benjamin Cohen, Butte City, Mont., inventor; Jere M. Clifford, William Wear, and J. Mattingly, same place, assignees. Billiard Table Cloth Fastener and Mail Bag Catcher and Deliverer. Two patents.—It is the aim of the first patent to provide billiard table cloth fastening means, adapted to enable the cloth of a billiard table to be put on and taken off in a very few minutes without wearing or tearing the same. A further object of the invention is to provide billiard table cloth fastening means, adapted to enable the cloth to be readily stretched over the bed of the table and securely fastened to the same in a smooth and tight condition.

The object of the second patent is to provide means for delivering a mail bag from a mail car to a mail crane at the side of the track, and to enable the crane to be reversed to arrange it for trains running in either direction. A further object of the invention is to provide a mail bag catcher, adapted after it has removed a mail bag from a mail car, to be swung automatically out of the way of passing trains by the mail bag.

Thomas J. King, Richmond, Va. Combined Weeder and Harrow. Two patents.—The first patent relates to a combined weeder and harrow, designed particularly for weeding and thinning out or chopping cotton plants, and capable of operating effectively on smooth and rough lands. A further object of the invention is to enable the teeth of the combined weeder and harrow to be readily adjusted to cut either shallow or deep at the will of the operator, for touching lightly soft places, and also for applying the desired pressure in hard places.

The second patent covers a harrow, adapted for leveling and smoothing lands and for crushing clods, and provided with an adjustable harrow frame under complete control of the operator, for causing the harrow to touch the soil lightly or cut deeper. A further object of this invention is to provide a combined weeder and harrow having means for locking the movable harrow frame at the desired adjustment and for raising it clear of the ground to prevent an accumulation of trash from injuring young plants, and also to permit the harrow to be easily turned, and to enable the same to pass stumps and other obstructions without injuring the harrow teeth.

Davis Sheen, Sonora, Texas. Pump Valve Mechanism.—This invention relates particularly to valve mechanism for deep well pumps, although the same is clearly applicable for use in other relations. The principal object is to provide a mechanism which is very durable, is not liable to become leaky, deranged or inoperative, can be readily withdrawn as a whole from the well, and has the parts so constructed and arranged that they may be easily inspected, disassociated and replaced should it be found necessary or desirable.

William L. A. Wright, San Angelo, Texas, inventor; Henry D. Knight, Diana, Texas, assignee, one-half interest. Rotary Engine.—The object of this invention is to provide a novel and simple structure that will secure a high degree of power from the steam or other motive fluid, will automatically take up wear, and is so constructed that the parts can be readily adjusted to prevent the escape of steam and the consequent loss of power.

Herbert C. Bluthenthal, Pine Bluff, Arkansas. Shoe Polisher.—This invention relates to a combined dauber, brush, and polisher for shoes, harness, etc., and has for its object to provide means to protect the hand from dirt and polish while either the brush or polisher is in use, and comprises a movably mounted guard arranged in such relation to the brush and polisher as to be used as a cover for either.

Mark Jones Dunkel, New Bloomfield, Pa. Crutch.—The invention relates to improvements in crutches, and has for its object to provide a simple and comparatively inexpensive one, designed particularly for use in winter and having means for presenting either a plurality of spikes, or a cushion, to the supporting surface to prevent a crutch from slipping on ice, etc., or to avoid injuring the carpet or floor of an apartment or the like.

Marshall L. Carraway, McNeil, Arkansas. Hand Garden Cultivating Implement.—The invention relates to a hand garden cultivating implement, and has for its object to provide such an implement having a reversible blade adapted to be securely clamped in either position by a single fastening device, whereby the blade may be quickly changed from one position to the other.

Michael D. Schaller, Vernon Center, N. Y. Thill Support.—The object of this invention is to improve the construction of thills for sleighs and cutters, and to provide a pair of thills of simple and efficient construction adapted, when sleighs or cutters pass each other, for effectually preventing the same from colliding or locking.

Isaac M. Newman, Hewins, Kansas. System of Subterranean Drain Irrigation and Method of Utilizing Same.—This invention relates to means for draining and irrigating land, and has for its object to provide a novel apparatus or equipment which is placed below the earth's surface, so that it is out of the way and is arranged to drain the water out of the surface soil of wet lands, and conduct water to land that is too dry, thereby draining one and irrigating the other.

John C. Gamel, George L. Willis and Horace E. Bonner, inventors, Hubbard, Texas. Hay Press.—This invention has for its object to improve the construction of hay presses, and to provide a simple, inexpensive and efficient one of great strength and durability, adapted to be adjusted to enable it to be conveniently transported from one place to another, and capable of rapidly baling hay and other material, and also adapted to be adjusted so as to run at different speeds.

Christopher T. Powell, Chicago, Ill. Safety Brass for Motor Bearings.—This invention relates to a safety brass for motor bearings, and has for its object to improve the construction of journal bearings, and to provide a simple, inexpensive and efficient device designed for use in motor bearings, and adapted to form a support for the armature shaft to prevent the armature from dropping upon the poles, should the babbitt, or other soft metal lining, melt.

James T. Brewer, Dayton, Tenn., inventor; John W. Hudson, Rhea, Tenn., assignee one-half interest. Blasting Cartridge Shell.—The object of this invention is to provide a simple, inexpensive, and efficient blasting cartridge shell adapted to enable a blasting cartridge shell to be quickly made, said shell being adapted when filled to be easily introduced into a hole, and having means for enabling a fuse to be readily and securely attached

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FOR SALE—Patent No. 822,828. Railway Crossing. Carries car over crossing track. Saves cutting rails. Desirable where interurban crosses steam roads $800 cash if taken quickly. Address, R. W. Cress, Rosedale, Indiana. nov

FOR SALE—Patent No. 917,595, issued April 6, 1909. A folding canvas cot. Splendid for children and especially adapted for outdoor use. Will sell for part cash and small royalty. Address, Mrs. Emma Grant, Cloquet, Minn. nov

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FOR SALE—I will sell outright, or will sell state or county rights, or have manufactured on a royalty, my holder for fruit jars. U. S. patent No. 925,315. Write me for copies if you are interested. Address, James G. Dutscbke, Cecilia, Kentucky. nov

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FOR SALE—Patent No. 918,149, dated April 13, 1909. Hoof pad, for soaking horses hoofs. Has pad for bottom of hoof and pad for front of hoof. Will sell patent outright for $1,000. Just what the veterinary surgeon needs. Address, William Heathermon, Kneeland, Wisconsin. nov

FOR SALE—A patent hose-nozzle No. 860,054, issued July 16, 1907. Its advantages over all others are three. First, you can throw one-third more water; second, throw as much when spraying as when throwing a solid stream; third, relieve the hose of all back pressure. Will sell outright, cheap. Address, George Pecover, No. 611 N. Spruce St., Colorado Springs, Colo. nov

FOR SALE—Patent No. 908,742, dated Nov. 10, 1908. Dividing board for mowing machines. If stump or any obstruction is struck it folds toward machine and unfolds when machine starts forward. If sold soon will take $2,500, or might sell state rights or sell to manufacturer on royalty. Address, Ralph Loving, Powell, Wyo. nov

FOR SALE—U. S. Patent No. 893,193. Automatic Valveless Wheel Flange Oiler for oiling the curved rails of street railways, which work is now done by hand. This invention is simplicity itself. Can be manufactured for $1.00 each. Two are required on a car. In a working test on a street car it has proved a thorough success Address, F. G. Phillips, No. 1614 Keefer St., Vancouver, B. C., Canada. dec

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FOR SALE—Patent No. 899,489, dated Sept. 22, 1908. Pick Ax Guard. A device that is much needed in rock work and coal mines. Saves the handle from wearing out and keeps it solid in eye of pick. A simple working device. Cannot be a better one invented. Would like to hear from any one who buys patents. Address, T. W. Gordon, East Franklin, Maine. feb '10

FOR SALE—No. 918,163, dated April 13, 1909. Window Opening and Closing Device. Automatically maintains temperature of room normal. Very valuable patent. Address, Lee O. Kemp, Fouke, Ark. oct

FOR SALE—Patent No. 916,322, dated March 23, 1909. Fence Construction. Includes concrete base and corrugated galvanized iron post with corner brace for wire fence. Address, S. R. Johnson, Winston, Missouri. sep

FOR SALE—U. S. Patent No. 912,631, issued Feb. 16, 1909. A new device which securely fastens the upper and lower sashes at any desired distance for purpose of ventilation. Will sell outright for reasonable price. Address, E. L. Thompson, Gethsemane, Ark. sep

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FOR SALE—Patent No. 913.125, dated Feb. 23, 1909. Picture Hanger. Can be manufactured at twelve cents each, and sold for thirty-five cents. Good reasons for selling. Can be adjusted in a moment. Address, Mrs. Feefee Green, Custer, Montana. sep

FOR SALE—Patent No. 901,124, dated Oct. 13, 1908. Air agitating device for valve-bearing solutions, or any solution requiring constant agitation. For full particulars address, Thomas A. Ross, Selby, Contra Costa Co., Cal. nov 09

FOR SALE—Patent No. 919,083. Money holder for mail boxes, patented April 20, 1909. A tin device which can be cheaply manufactured. Will sell outright or by states. Address, Frank Spenner, Route 1, Stayton, Oregon. oct

FOR SALE—I have a valuable patent for sale. The best of its kind. Will sell outright for a reasonable price if sold quickly. The said patent is an improvement in trace carriers. For particulars, address, S. M. Wold, Box 303, Estevan, Sask., Canada. oct

FOR SALE—No. 891,875, issued June 30, 1908 and patent No. 902,624, issued Nov. 3, 1908, The Wisconsin Litter Carrier. For sale for $5900; or $2500 cash and $1.00 royalty on each one sold. The best working carrier on the market. Address Byron Snyder, Clinton, Wisc. oct

FOR SALE or Partner—Patent No. 891,739, dated June 23, 1908. Skirt supporter for holding up ladies' skirts while walking or crossing muddy streets. Have dies ready for manufacture. Will sell for cash on easy terms or take good partner. Can get manufactured very cheaply. Address, Walter W. Schwotzer, Rodfield, Pa. oct

FOR SALE—Patent No. 920,685. Requires only one-tenth as much oil as other wheels. Axles run in oil. No waste, no friction. Can manufacture as cheaply as common wheels. A money maker. Will sell outright or half interest. Address, J. S. Strawn, Avonmore, Pa. oct

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FOR SALE—Patent No. 922,053, May 18, 1909. Adjustable shingling gage. A time and labor saving device. Malleable cast. Large profits. U. S. rights $1500, Canadian rights $800, both for $2000. Address, William H. Smothers, Millston, Wisconsin. oct

FOR SALE—Patent No. 924,527, issued June 8, 1909. Phonograph stop. Needed on every cylinder phonograph in U. S. It stops the machine as soon as the record is finished and prevents injury to same. Will sell outright or state and county rights. Address, F. H. Andrews, Watsonville, California. oct

FOR SALE—Patent No. 917,911, issued April 13, 1909. Simple, effective, durable and easily repaired. A perfect substitute for expensive gate valves at the ends of any kind of pipe or tiling. Price $5000. Address, A.C. Thompson, Falfurrias, Texas. oct

FOR SALE—Patent No. 618,445, issued April 13, 1909. This invention is a cultivating attachment for any sort of turning plow. Will cultivate each furrow at the same time it is plowed. Write for full information and terms. Address, N. C. Y. Gundholm, R.F.D. No. 1, Box 36, Tallahassee, Fla. oct

FOR SALE—Patent No. 620,239, issued May 4, 1909. Mail Receiver and Deliverer. Will sell outright at a reasonable price. For particulars, address Joseph O. Anderson, Bercail, Mont. mar '10

FOR SALE—Patent No. 912,708. Hand massage machine. Only one of its kind in the world. Will sell you all rights, including tools for making same, and turn over orders for 15,000 machines. Money wanted to invest in another line at once. A snap, and will be sold in a few days. Address Box 816 A. Kalamazoo. Mich. oct

FOR SALE—Two Patents on Trunk-Tray Form, U. S. Patent No. 870,949, issued Nov. 12, 1907, Canadian Patent No. 116,503, issued Feb. 9, 1909. This is a great labor saving device. Will accept the first reasonable offer. Address, Walter S. Gilson, 347 S. State St., Chicago, Ill. nov

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WASHINGTON, D. C., SEPTEMBER 1, 1909.

Inventors as Managers of Their Enterprises.

It is the most natural thing in the world for a man, when he has originated an invention and formed a company for its manufacture, to desire a position of authority in the enterprise in order to determine the course of development. He has worked out the device, knows its advantages and thinks that no one will appreciate its possibilities quite as well as himself. While this is true, it is a fact nevertheless that this does not give him prestige or ability as a manager. An examination of the actual workings of manufacturing concerns would reveal conditions likely to discourage the appointment as directors or managers of those who have originated the article that is being made. It is a matter of common knowledge that, as a class, inventors make poor business men. They have the reputation, usually well deserved, of impracticability. An inventor works to improve his own device, not to promote its commercial output. Business men understand this, and as a rule they will not take an interest in an invention or in the company exploiting it, where the inventor is in a position of authority. Many an inventor has lost valuable chances to develop his device by demanding a controlling interest in the enterprise, when the fact is it would be better for him to occupy a subordinate position. Inventors and business men do not, as a rule, have a very good understanding. The business man looks disparagingly upon the inventor, regarding him as somewhat of a crank, while on the other hand the inventor has a poor opinion of his associate, assuming that since he himself has invented the article and the public wants it, any one can sell it. But both are useful in their places.

There are too many instances of failure caused by the injudicious interference of inventors with the commercial side of the enterprise with which they happen to be connected. We have known of cases where inventors have wasted years in experimenting with devices which would have met with a ready sale as they were, and given satisfaction to the public; and all through a mistaken conviction that they could better the original. We have in mind a particular case, in which a man invented a gun—a very good gun, and one in which others were willing to invest money. But instead of allowing his partners to go ahead and put it on the market, the inventor kept on applying for and securing patents on modifica- each gun being different from the tions, preceding one. He was never satisfied to let well enough alone: he had other ideas in his head, and believed that if he could keep on working them out, he would in time evolve the perfect gun. He wore out the patience and exhausted the pocket books of several partners, and so far as we know, has never yet reached his goal. And this is characteristic of inventors in general. They think only of the possibility of improving their contrivances, while a practical business man knows that the world will buy them without improvement. The inventor, absorbed in his thories, goes on experimenting, causing delay after delay, heedless of the inconvenience and loss to the promotors. The business man, knowing well that perfection is impossible in any line of human achievement, is content to give the best at his command. The situation is so clearly realized by capitalists that there is a growing tendency to avoid connection with companies where the dominating interest of the inventor frustrates the commercial judgment of his partners.

The inventor, however, has a proper place in the management of an enterprise, as a consulting member of the staff, with no voice as to the manufacture and sale of the article. We believe the best arrangement is for him to be associated with the concern in the capacity of mechanical or consulting expert, and paid a regular salary to devise improvements in the invention. In the meanwhile, those in charge of the company can manufacture and exploit the article as it has been adopted, together with changes that are necessary to keep the enterprise abreast of the times. Every large concern has its experimental plant, where new ideas are constantly being brought out and developed, and it is there that the inventor should be, in a measure, supreme. He should be content to remain there. When he assumes to control the general policy of management, shipwreck is likely to follow, for there is not one inventor in a thousand—we may say in ten thousand—who combines the imaginative faculty and the skillful ingenuity involved in the contrivance of a new machine, with the common sense and practical foresight of a successful business man.

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The Success of the Airship.

History was made in Washington last month, when the Wright brothers finally succeeded in complying with the tests demanded by the government, and their aeroplane developed the speed and staying qualities necessary for regular use.

Two things the adventurous spirits of the world have tried to do for ages: reach the North Pole and achieve a real conquest of the air. The North Pole remains inaccessible, although with success in the other line, it is probable that it will not long remain so; but when its icy barriers have been surmounted, little advantage will come to the world. But the conquest of the air, the ability to fly, the dream of poets and inventors since the days of Daedalus, is no longer a chimera. It is a matter of actual fact, and America reaps the glory.

The two young men who are now so prominently before the world's eye are quite unspoiled by their triumphs in Europe. Being feted by royalty has not caused them to "go up in the air" in any but a literal sense. They are so modest and retiring, so little given to self-advertisement, that it is difficult to lionize them. Consequently, the world knows less about their personalities than it does of those of many utterly negligible people. The story of the development of their airship involves the description of qualities so characteristic of American life and spirit, that a summary will be of interest to other inventors.

They are young men to have achieved so much—neither of them is out of the thirties. They had no fortune to squander in experiments, no wealthy patrons: they had only courage and persistence. Other aeronauts had governmental backing and scientific co-operation. Zeppelin in Germany, and Santos-Dumont in France, were able to spend thousands of dollars in carrying out their ideas. But these young Ohioans, the sons of a poor preacher, without technical training or academic education, forced to make a living by keeping a bicycle repair shop, have done what unnumbered hundreds of Maxims and Langleys and Edisons have tried in vain to do. And their success has not been the result of dare-devil adventure, but of years of serious study, careful scientific investigation, tireless zeal in the face of great difficulties.

The question of flying has interested them since they were boys. They began by making careful experiments with kites. They read all that books had to say on the subject—which, meagre in practical knowledge as it is now, was even less then. One must hear them describe their slow progress in order to realize the immensity of their task. They made machine after machine, and between each one came months of research. They found that nobody had properly formulated the action of air currents against surfaces of different shapes, placed at different angles; that the slightest variation of the curves of a flying machine meant new and un-dreamed-of complications. They tested the effect of the wind upon each kind of aeroplane, each size of tail or rudder, each weight of propeller and machinery. They met winds of various force, sailed with and against them. In short, they explored a region wholly unknown and uncharted. By 1900 they had a machine that would sail, but would not carry a man. By 1903 they had one that carried a man for a minute, or a distance of 900 feet. In the next year their machine flew a mile, and in 1905, it flew 24 miles. The feat had been accomplished. It remained only to perfect details, but it has taken these painstaking and conscientious inventors several years to do that. To quote Orville Wright's own words:

"No one who has not navigated the air can appreciate the real difficulty of mechanical flight. To the ordinary person it seems a miracle that a thin, solid plane can be driven up into the air by machinery; but the real problem—the problem of equilibrium—never occurs to any one who has not actually tried flying. The great question of the flying machine is how to keep it from turning over. The chief trouble is the turmoil of the air. The common impression is that the atmosphere runs in comparatively regular currents, which we call winds. No one who has not been thrown about on a gliding aeroplane can understand how utterly wrong this idea is. The air along the surface of the earth, as a matter of fact, is continually churning. It is thrown upward from every irregularity, like sea breakers on a coast-line; every hill and tree and building sends up a wave of slanting current. And it moves, not directly back and forth upon its coast line, like the sea, but in whirling rotary masses. Some of these rise up hundreds of yards. In a fairly strong wind, the air near the earth is more disturbed than the whirlpools of Niagara."

The success of the aeroplane will thus not only offer the world a new form of locomotion, but will open another field of scientific research, the results of which will be of great value to the weather service as well as in other directions.

Treating Wood.

Although wood has long been used for street pavements, it is only within the past few years that it has given satisfactory results in cities of the United States. Improper construction, and especially improper methods of preparation, are mainly responsible for failures in the past. In most cases blocks of cedar or other woods were used without any effort to guard against decay, and without adequate foundation. The consequence was that wood, as a paving material, has fallen into disfavor. Experiments with blocks which have been subjected to special treatment, however, have shown such favorable results that we think it probable this judgment will be reversed. The creosoting of wood has advantages, among which may be mentioned its smoothness when used for pavements, its low

traction resistance, and the minimum of noise created. It is also easy to clean and to maintain, and it is not more slippery than sheet aspbalt.

A coal tar extract called injectol has been used in some places. This is a liquid product, of a dark brown color, and of regular density. Its degree of viscosity changes very little with atmospheric variations. One of the principal advantages is its penetration into certain woods without any pressure. It is much more rapid in its effect than creosote. As regards its antiseptic qualities, it has been found that while creosoted poles in the ground resisted decay only a few months, those treated with injectol remained unattacked after three years. Similar experiments were made with wood blocks and railway sleepers, some being soaked in creosote, some in a mixture of the latter and chloride of zinc, and some in injectol. After having been left for two years in a vat filled with decomposing substances, the blocks treated with injectol were found to be in good condition, while the others were almost entirely destroyed. Great things are hoped for from this new method.

In the same connection, an account of an interesting process in which dye is made to take the place of sap in wood, comes from Sweden. Coloring matter is forced into fresh cut lumber, and takes the place of the sap, imparting a brilliant color which does not fade after the wood has become seasoned. Birch, beech, alder, maple, elm and basswood are the varieties that respond most successfully to treatment. The dye can be forced through lengths of wood as great as 13 feet. When seasoned and polished, the colored wood presents a beautiful appearance and is used for making furniture and also for the fittings of railroad cars and steamers. A considerable industry, we are informed, is developing along these lines.

Rap'd Telegraphy.

European papers have been devoting space to the invention of a Hungarian, by which it is said the inventor may transmit 40,000 words per hour over a telephone. According to the descriptions, the machine consists of three parts, a perforator, a transmitter and a receiver. The first may be worked by a typewriter, while the other two are automatic, working through the agencies of electricity and photography, and the instrument may be connected by an ordinary telephone line. Through the keys of the perforator, the operator writes messages upon a long paper ribbon. By touching the keys, a series of holes are punched in the ribbon, each set of holes representing a letter.

After taking the ribbon from the perforator, the inventor places it in a small cylinder in the transmitter, and a touch of the switch sets the cylinder revolving. Before the ribbon has completely passed through the transmitter, a second broader strip of sensitized paper issues from the receiver, and upon it is transcribed the actual message which the operator has written on the typewriter. It is claimed that messages may be thus transmitted hundreds of miles, as well as short ditances.

Toothless Saws.

An explanation of the manner in which a soft steel disk, revolving at high velocity, cuts hard steel has been gained with the aid of a microscope and is described in the *Engineering Digest*. The result corroborates the theory that the material acted upon is heated at the place of contact to the fusing point, and then brushed away. The high temperature appears to be confined very narrowly to the point of contact, so that a thin gash is cut. The temperature of the revolving disk does not rise so high because of the large surface area of the disk. The part of the disk in contact is continually changing, while the frictional energy is concentrated on a very small area of the material subjected to its action.

Firing at Night.

After the smokeless rifle comes a device for enabling us to fire a gun at night, and hit the mark more easily than in daylight. This is effected by an electrical attachment, which works on the principle of the flashlight, the battery being carried in the pocket, while the current is transmitted by a wire running through the sleeve. In the center of the flash of light there appears a small shadow, which is made by placing a small bead in the middle of a powerful lens, and the shadow made by this bead is thrown at the exact point where the bullet will strike. At a distance of 90 feet the flash made is about the size of a large orange. The device is attached by clamps, while the length of the tube may be made to correspond with the length of the barrel. A clasp button held on the ball of the thumb completes the circuit by pressing against the end of the tube.

Protecting Fruit from Frost.

It has long been common in Europe to employ elaborate systems of defending vineyards and other crops against frost and hail, as well as of inducing rain, of driving off locusts and grasshoppers, etc. One of the recent processes of producing artificial clouds to guard against frost might be adapted advantageously by American horticulturists. It consists, according to our consul at Bordeaux, in filling small wooden boxes, open at top, with an inflammable composition consisting of a mixture of equal parts of resinous with earthy matters (clay, terra alba, and the like) reduced to a fine powder and pressed into a compact mass. In the center a wick extends through the compound and serves to kindle it. The wick, however, may be dispensed with and the composition ignited by pouring a few drops of alcohol or petroleum over the mass and applying a match. These boxes, eight inches long by six wide, made of pine wood, are placed in line about 30 feet apart around certain areas, say of 50 acres. The mass in the boxes to the windward is ignited, and a dense cloud of smoke is produced, hanging over the field and forming a shield against unfavorable weather conditions. If it is desired to extinguish the fires, it is only necessary to have an open box a trifle larger than the others, by means of which the flames are quickly smothered. It is claimed that by this method of producing smudges, 50 acres can be protected at an expenditure not exceeding two dollars.

Steel Towers for Electric Power Transmission.

The large number of hydro-electric power plants now being installed in the United States and other parts of the world, solving the problem of transforming water power into electric energy, and the transmission of electric power long distances from the generating station to the markets for lighting and motor service, have required mechanical supports for the electrical conductors.

The high voltage used in the long-distance lines, (up to 100,000 volts) necessitates the best forms of construction for supporting the work, and steel towers, resembling miniature Eiffels, are now rapidly replacing the old time wooden poles. These towers are intended to carry a guard wire at the top, about 76 feet above the ground, and six electric power transmission feeder wires, one at the outer end of each cross arm. These feeder wires are ten feet apart in the vertical plane and more than 17 feet apart in the horizontal plane. All of the feed wires are more than six feet from the nearest point of the pole proper, measured in a horizontal direction, and the lowest cross arm is over 65 feet from the ground level. The towers are 17 feet square at the base, four legs being provided for stability.

When tested in a vertical position on immovable foundations, these poles are said to be able to stand a simultaneous horizontal pull of 1,000 pounds at the top and 2,500 pounds at each of the cross arms, or a total strain of 8,500 pounds. Since installations of hydro-electric plants are very expensive, often costing millions of dollars, and since they are intended to work for an indefinite period of time, it is considered economy to build these steel towers, galvanized construction being recognized as the best modern practice.

Concrete Armor for Ships.

The Dreadnoughts of the future will probably be clothed in armor plate of reinforced concrete. The idea came to an eminent Italian engineer who had observed the remarkable resistance offered to the Russian projectiles, at the siege of Port Arthur, by the Japanese casemates which were made of concrete. Experiments in other countries have also shown surprising results, in the effect of gun fire upon concrete. The inventor has a special manufacture of cement, mixed with hard stone and sand, which applied in a five inch coat, will resist armor piercing projectiles, and in a three inch coat, will turn back shells. The interior of the concrete armor consists of a net work of iron bars, as an additional reinforcement. The hardness of the concrete is graduated like that of Krupp steel armor, the outer layer being harder than the interior. The inventor contends, very properly, that there is a great difference between the proving ground and the naval battle, and that in the former the advantage is all in favor of the projectile. In actual conditions of war, it is not fair to estimate the protection given to the ship by its armor on the basis of the results of tests made at the proving station. The penetrating power of projectiles depends upon various conditions, which cannot be foreseen. If concrete affords enough protection for land fortresses, it ought to be equally effective when applied to floating batteries. The great displacement of modern war ships will permit the carrying of concrete armor with a thickness of 60 inches at the water line and 40 inches above it. At the usual fighting distance, 60 inches of reinforced concrete of the best construction cannot be pierced by a 12 inch armor piercing projectile. The steel point of such a projectile would be softened, if not melted, by the heat of impact and friction before it had passed through 24 inches of concrete, and the remnant of penetrating power would be destroyed by the chemical action of the ingredients of the concrete. On the other hand, explosive shells could not penetrate to any depth, but would burst and waste their force on the outer layer. The engineer, at a recent meeting of the Society of Naval Engineers in Italy, exhibited drawings showing the possible applications of concrete armor to new battle ships, and stated that it would cost nearly $1,500,000 less per ship than the steel armor actually used.

New Phonograph.

A recent German invention is intended to obviate the buzzing or rumbling sound of phonographs, caused by the friction of the needle resting upon the surface of the rapidly revolving disk or cylinder. The new device combines the leading elements of the phonograph and the siren. The novel and essential feature, says *Van Norden's*, is the substitution of a current of compressed air for the needle or stylus formerly used. On the surface of a large record cylinder tangential incisions are made. A second and perfectly smooth cylinder rests close against this perforated cylinder, revolving in unison with it. A constantly varying succession of minute openings between their surfaces is presented, due to the incisions on the record cylinder. When a powerful blast of compressed air is directed upon the line of contact between the two cylinders at such an angle as to be an exact tangent to the surfaces of both, sounds are evoked identically as in the case of an ordinary siren. The cylinders thus far employed are about ten times larger than ordinary phonographic cylinders, and this fact renders the instrument somewhat clumsy.

A CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE. This keeps inventors and manufacturers posted in the art in which they are most interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy; twenty copies $1.50.—Please give correct data in ordering.—Address,

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Animal-trap.....M. Johnson
Armature for electric machines.W. J. Bauroth
Asphalt-spreading apparatus, Liquid-.....C. A. Baldwin
Automatic carrier.....S. H. Libby
Automatic multiplex press.....D. W. Custer
Automatic sprinkler.....G. I. Rockwood
Automatically opening and closing dies.....F. A. Errington
Automobile-axles, Combined driving and steering wheel for.....S. V. Dusseau
Automobile steering-gear.....G. S. Hill
Automobile transmission-gears, Cover for.....H. V. Young
Automobiles, Transmission-gearing for.....M. L. Williams
Autopiano.....W. F. Bayer
Axle-box for locomotive-drivers.....E. Fuller
Baggage-rack.....W. S. Hamm
Baling-press.....J. R. Browning
Ball-and-socket flexible joint.....G. F. West
Ball-cups, Making.....A. G. Anderson
Ballot-box.....C. P. Sullivan et al
Ballot-box.....A. Page
Bearing, Ball-.....E. Sachs
Bearing casings, Detachable lining for roller-.....C. I. Shirley
Bearing, Roller-.....J. E. Parrish
Bearing yoke driven by shaft, Roller-.....P. S. Steenstrup et al
Bed.....W. H. Cling
Bed attachment.....D. A. Carson
Bell, Swinging.....W. P. Elliott, Jr.
Belt-shifter.....F. A. Carlton
Billiard-cue.....L. Kálmánovitis
Binder, Loose-leaf.....M. Smick
Blanket-grip.....C. Ross, Jr.
Blanks, Cutting.....E. S. Stiles
Bleaching.....F. Fuhrmann
Bleaching and preparing straw from the Southern palm.....E. Pickett
Blinds, Mechanism for operating Venetian....F. C. Thompson
Block-signal system.....A. G. Davis
Boiler-flue.....J. M. Crozier
Boiler-flue cleaner.....W. J. Bradley
Bookcase.....W. W. Points
Boot and shoe.....T. C. Young
Boot-cleaner.....E. G. Killerbrue
Bottle, Nursing-.....R. A. Van Cleave
Bottle-opener.....J. Hough
Bottles, jars, and the like, Stoppering.....M. Quillot
Bottles with acrated waters, Machine for filling.....W. J. and J. Forrester
Bowl or tureen.....O. A. Boehm
Brake.....W. S. Adams
Brake-shoes, Forming steel backs for.H. Jones
Branding appliance, Self-heating adjustable cattle-.....W. G. Landells
Brick-drying rack.....E. H. Callaway
Broom-hanger.....J. H. Ashmead
Brush-bridle.....B. C. Gindorff
Buckle, Bailing-tie.....C. H. Herth
Buckle, Belt-.....J. Hough
Buffing-machine.....J. F. Gail
Building-block and wall constructed thereof..J. Rehaut
Building construction.....J. D. O'Neil
Building material.....J. Schirra
Bunching and counting machine.H. Smithwick
Burglar-alarm.....J. B. Nash
Butter-server.....O. W. Moberg
Cabinet.....A. H. Klug
Cable-grip.....J. C. Dawson
Cable-hanger.....J. E. Feiock
Cable-joint, Self-soldering.....W. Reid
Cable terminal, Electric-.....C. W. Davis
Calculating-machine.....A. C. Cornelison
Calendar.....H. B. Young
Calendar pad and stand, Memorandum.....W. M. Chamberlin, Jr.
Camera, Photographic.....G. Vogt et al
Cameras, Magazine plate-holder for.....E. L. C. Morse
Can-heading machine, Multiple.....B. Adriance et al
Candy articles, Making hollow....J. F. Sigrist
Car-bolster.....J. A. Lamont
Car-coupling.....R. D. Gallagher, Jr.
Car-coupling.....C. Dobbs
Car-coupling.....A. Moritz
Car-coupling.....H. C. Crigger
Car-door.....A. A. Davis
Car door, Grain-.....W. G. Douglass et al
Car emergency draft-gear attachment, Railway-.....G. H. Gilman
Car fender, Street-.....V. Allegra
Car-stanchion.....W. P. Seofield
Car steel underframe, Railway-.....G. B. Robbins et al
Car, Tram-.....P. Kavanagh
Carbureter.....A. C. Bennett
Carbureter.....J. A. Carlson
Card counting and stacking machine.....C. E. Sargent et al
Carding-engine and like machine.W. L. Holland
Cards, Playing-.....S. A. Cohen
Case or box.....F. J. Krementz
Casein, Machine for grinding green.L. Axtell
Cash and package carrier propelling mechanism.....L. B. Bethards
Caster.....B. C. Mathes
Caster track, Bed-.....P. C. Chabassol
Centrifugal separator.....J. A. B. Dominguez
Chair.....L. P. Doering
Chimney-cowl.....J. T. Proffitt
Chuck, Lathe-.....J. G. Oliver
Churn.....O. J. Neal et al
Churn.....O. G. Klein
Chute cart or wagon.....A. Hartl
Cigarette-manufacturing apparatus.....O. Wartmann
Cleansing-machine.....F. W. and G. L. Reed
Cloth-cutting machine adjustable presser-foot..H. A. Meyer
Clothes-drier.....J. D. Leen
Clothes-drier.....H. W. Sauber
Clothes-rack.....W. L. Smalley
Clothes-wringer swinging support.....C. E. Ramby et al
Clutch, Pneumatic.....J. C. Garrett
Coal-picking table.....J. E. Jones
Coat-hanger attachment.....N. E. Weigle
Cock for gas-ranges, Gas-.....H. G. Burrows
Coil.....C. Schrader
Collar.....B. S. Ells
Collar.....C. I. Mandel
Column for buildings and other structures....E. V. Johnson
Compressed-air engine.....B. V. Nordberg
Concrete beam, Reinforced-..C. A. P. Turner

Concrete-mixer. W. D., E. S., and J. G. Clough
Concrete wall.....P. H. Bosworth
Condenser.....H. A. Hogel
Condenser.....A. Kuylenstjerna
Condensing fumes.....H. A. Hogel
Conduit system, Third-rail-...P. M. Reynolds
Confectionery-holder.....E. J. Adams
Control apparatus.....G. H. Hili
Convertible chair.....E. T. Marsh
Conveyers, Deflector for gravity-.M. C. Schwab
Cooking-vessel extensible support.....J. Wahl
Cork-extractor.....G. B. Argo
Corkscrew.....R. De Bersaques
Corn, Machine for separating silk from green. H. H. Ulery
Cotton-chopper.....C. E. Delano
Cotton-picker.....M. B. Coe
Cotton picker and cleaner, Lint-....J. L. Hart
Counter-molding machine.....W. J. Young
Counter, Recording-.....A. P. Phillips
Cover or closing disks, Machine for making.. F. L. Nichols
Crate, Knockdown shipping-.....W. Englich
Crate, Shipping-.....D. J. Harding
Cream-separator.....W. Kolvig
Crusher.....M. G. Bunnell
Cultivator shield, Corn-.....F. G. Trimm
Cupboard and bed combined.....O. Knutson
Current indicator or detector...C. D. Babcock
Current motor, Alternating-..... E. F. W. Alexanderson
Currents, Rotary converter for direct..... L. A. Hawkins
Curtain-pole.....A. C. Butcher
Curtain-rod.....A. T. Howland
Cushion.....A. H. Ordway
Cuspidor.....F. E. Fellion
Cuspidor-cover.....L. E. and J. B. Wilson
Cutter.....E. W. Jones
Cutter-head.....O. L. Siscoe
Cycle, Motor-.....G. M. Hoenecker
Dating and delivering apparatus, Ticket..... E. W. Bell
Dental hammer, Automatic.....R. P. Lyle
Dental-instrument tray.....J. Brun
Derrick, Sectional.....W. E. Carmony
Desiccating apparatus.....J. Roeh
Developing apparatus, Daylight...J. W. Meek
Diaper-fastener, Infant's.....W. M. Conrad
Dictograph.....W. F. H. Germer
Die-plate, Multiple.....W. R. Gwin
Dish-washing machine.....J. J. Holley
Disinfectant apparatus.....F. D. Raforth
Disinfectant-holder.....P. Duenwald
Display cabinet, Seed-.....M. E. Jobes et al
Display rack, Knife-.....C. P. Catlin
Door-hanger.....G. W. Stuyverson
Door hanger, Sliding-.....J. W. Ohl
Doubling and twisting machines, Stop-motion device for.....F. W. Rochelle
Dough mixer, Pie and biscuit...E. P. Violette
Draft-gear, 2 pats.....A. L. Stanford
Draft-rigging.....J. J. Dippel
Drain or sewer pipe.....W. L. Jackson
Drill-socket.....H. E. Bradley
Driving mechanism, Foot-power. J. F. Wilkinson
Drum, Heating-.....W. S. Keyser
Dumping-elevator.....E. B. Symons
Dust-pan.....A. W. Devol
Dyeing, bleaching, &c., Apparatus for..... A. W. Thompson
Electric contacts, Device for cleaning or truing J. A. J. Haslop
Electric heater.....K. Schlüter
Electric isolation system.....N. C. McClure
Electric lock.....T. C. Nixon
Electric machine, Dynamo-.....L. A. Pape
Electric machine, Dynamo-.....B. A. Behrend
Electric protection system....C. U. Carpenter
Electric service-circuits, Connection-block for. J. G. Swallow et al
Electrical-conductor junction-box, 2 pats..... J. F. Burns
Electrical selector.....E. A. Faller
Electrical switch.....R. H. Manson
Elevator-door, Counterbalancing.....A. Tolf
Elevator safety device, Mine-...J. K. Williams
Engine.....C. Tuckfield
Engine muffler, Explosive-.....G. A. Jackson
Engine sparking mechanism, Explosive-..... G. Germani
Engines, Air-heater for compressed-air..... H. W. Shonnard et al
Envelop, Church-offering.....J. H. Earle
Envelop, Safety-.....J. W. Carr
Evener-bar.....C. A. Whipple et al
Excavator, Multiple.....C. C. Jacobs
Expansion-bolt.....H. W. Mower
Explosion-engine.....J. and F. O. Peterson
Explosive-engine.....L. Petterson
Eyeglasses.....L. F. Adt
Eyeleting-machine.....R. B. Smith
Eyeleting-machine.....W. F. Lautenschlager
Fan-blower.....D. J. Bemiller
Fare-collector.....J. H. Coleman
Fastening device, 2 pats.....F. H. Richards
Faucet, Safety-.....R. P. Wilton
Feed-bag.....W. J. Rayburn
Feed-bag.....D. L. Toland
Feed-motion device.....F. J. Waters
Ferrules or rings, Die for forming plastic-compound.....E. Miltner
Fertilizer-dropper and planter...L. B. Thomas
File.....E. Rustin
File-cabinet.....L. S. Morris
File, Card-.....S. T. Walton
Finishing-nail.....J. J. Simon
Fire apparatus, Device for raising and lowering.....C. M. Dean
Firearm.....N. Pieper
Firearm.....L. L. Hepburn
Fire-bucket.....D. B. McLaughlin
Fire-door.....T. E. Collins
Fire-escape.....J. Krasmer
Fire-escape.....W. H. Jay
Fireplace.....C. L. Taylor
Fish-plate.....L. W. Ackerson
Flax-puller.....W. G. Griffin
Floor-surfacing machine.....A. E. Johnson
Flooring, Sanitary.....N. J. Clayton
Flushing-tank float.....H. C. Johnston
Flying-machine.....L. J. Brown
Flying-machine.....P. V. Wadleigh
Flying-machine.....M. B. Sellers
Furnace.....T. S. Blair, Jr.
Furnace-grate, Steam-generator....R. A. Tarr
Furnaces, Stirring and conveying device for.. U. Wedge
Game apparatus.....S. Bristow
Game apparatus, Card-.....B. A. Staley
Garbage-can.....I. Gluckman
Garment.....G. M. Gray
Garment-rack, Folding.....A. May
Garment-pressing machine..E. Schumann et al
Garment-supporter.....A. C. Davis
Garment-supporter.....D. Wertz
Garment-supporter.....J. H. Bryant
Gas-fixture, Self-closing.....C. Schmidt
Gas from wood, Manufacturing..... B. Loomis et al
Gas-generator.....R. N. McDonough et al
Gas generator, Acetylene-.A. J. R. Marjenhoff
Gas, Manufacture of producer-..... W. J. Crossley et al
Gate.....I. D. Cady
Gear-wheels according to pattern, Machine for producing.....H. Lehman
Gearing.....A. N. Adams
Gearing.....T. H. M. Van Swieten
Glass clamp, Plate-.....L. Bartelstone
Glass-rinser.....H. Blum
Glassware to leers, Device for transferring... L. J. Robb
Gluing machine, Loose-wrap-...A. Cohn et al
Go-carts, Foot-rest for.....A. J. Adams
Governor, Vacuum-.....G. H. Beebe
Grader drag, Adjustable road-..G. W. Pointer
Grain-separating machine.....J. B. Cornwall
Grapple.....C. L. Simmons
Grate, Portable.....W. H. Bolland
Grease-cup.....C. J. Bushmeyer
Grinding-disk.....C. H. Richards
Grinding-wheel.....A. W. Puffer
Gun, Breech-loading.....F. M. Farwell et al
Gun training and firing mechanism..... J. F. Meigs et al
Hammer, Power-.....H. J. C. Keymer
Harvester, Beet-.....M. H. Wadhams
Harvesters and binders, Metallic conveyer-chain for.....S. C. English
Hat-brim edges, Apparatus for curling and ironing.....G. Atherton
Hay-rack.....C. W. Baird
Hay rake and loader, Combined.B. A. Spinney
Heater.....S. Keltonik
Heating system.....E. H. Gold
Heel-blanks, Machine for cutting the lips of.. G. B. Grover
Hide-treating machine, Short-cylinder..... A. H. Kehrhahn
Hinge.....G. H. Maas
Hinge, Double-acting spring-..M. A. Erickson
Hinge for electrical and other devices, Spring-.....L. H. Moulthorp
Hitching-strap fastening.....V. O. Parker
Hoist.....S. H. Libby
Holdback-hook.....I. D. Cady
Hook and eye.....J. F. Schoeppl
Hose connection.....I. S. Dunmyer
Hose-coupling.....E. Watkins et al
Hose-nozzle.....E. Nelson
Hose-rack.....A. Jones
Hunting-knife.....P. Hoglund et al
Hydrocarbon-burner.....H. Lemp
Hydrocaabon-engine.....F. L. Nichols
Illuminating device.....W. N. McComb
Incandescent mantles, Manufacturing..... A. Müller
Index.....C. J. Bryant
Indicator.....M. Arndt
Induction-coil.....A. K. Keller
Insulator.....L. Steinberger
Insulator.....J. T. Bond
Insulator and lightning-arrester, Combined... W. F. Hiatt
Insulator-bracket, Distributing..... A. L. Stadermann
Insulator, High-potential strain-..... L. Steinberger
Insulator, Tubular.....L. Steinberger
Internal-combustion engine.....E. W. Graef
Internal-combustion heat-engine..J. L. Bogert
Ironing-board.....J. H. Hartzell
Ironing-board.....F. M. Holmes et al
Ironing-machine.....A. Kreuter
Jar closure or fastener.....E. Welker et al
Jewel fastening, Ear-.....C. Weller
Jewelry.....J. L. Herzog
Joint.....E. Berliner
Journal-bearing, Self-oiling.....F. F. Landis
Keratin, Producing digestible substances from. C. Neuberg
Kerosene-burner.....H. Lemp
Key-receptacle.....F. Robinson
Knob, Door-.....G. B. Pickop
Knob, Screwless.....A. Arens
Knockdown box, 3 pats.....C. C. Mengel
Knockdown box or crate.....C. C. Mengel
Lace-holder.....J. Keel
Ladle carrier, Foundry-.....C. J. Blackham
Lamp.....C. M. Daniels
Lamp, Arc-.....R. Fleming et al
Lamp, Arc-.....W. S. Weedon
Lamp, Brake-oven.....G. C. Moore
Lamp, Electric-arc.....W. S. Weedon
Lamp, Electric-arc.....T. Spencer
Lamp-sockets, Adjustable casing for..... E. H. Freeman
Lamp socket, Electric-.....W. G. Lindemann
Latch.....W. G. Gregory et al
Latch.....J. A. Giese
Latch, Gate-.....A. J. and W. H. Russell
Latch, Reversible.....E. H. Summers
Lathe, Automatic.....J. J. Grant et al
Lathe, Multiple-spindle.....J. J. Grant
Lathe spindle and chuck construction, Monitor-.....E. J. McClellan
Lathing, Clip for metallic.....J. Francis
Leather substitute, Production of a..R. Weber
Linoleum, Manufacture of tiled..... C. V. Michalkowski
Liquid-conveying apparatus.....J. Beaupain
Liquid-treating apparatus, 2 pats..... K. W. Bartlett
Lock.....I. S. Goldman
Lock.....H. Schlichting
Lock-case construction.....A. Arens
Locking device for boxes, &c....A. von Heyne
Locomotive.....S. M. Vauclain
Locomotive-boiler.....S. M. Vauclain
Loom weft-replenishing mechanism..H. Zwicky
Loss-of-head and rate-of-flow gage. M. M. Borden
Lubricating means.....W. H. Dupré
Mail-bag catcher and deliverer, Combined.... J. E. Diefenderfer
Mail-carrier.....M. C. Cain
Mail receiving and delivering apparatus..... T. J. Moody
Manure-distributer.....C. W. Behrens
Manure-spreader.....L. S. Hackney
Massaging device.....K. Davis
Match-safe.....J. Borth
Measuring instrument, Electric...E. Thomson
Medicine-timer.....A. J. Scritchfield
Metal articles by pressure through dies, Apparatus for making.....J. Remmen
Metal articles, Making clad-.....J. F. Monnot
Metal, Clad.....J. F. Monnot
Metal-coiling machine.....E. O. Goss
Metal objects, Making compound. J. F. Monnot
Metal-working apparatus.....C. Huber
Metal-working machine.....E. R. Seward
Metals, Uniting or welding.....W. S. Simpson
Metallurgical furnace.....R. G. Reilly
Meter-lock.....J. H. Jackson
Molding apparatus.....M. J. Pignarre
Motor control, Alternating-current..... E. F. W. Alexanderson
Motor control, Single-phase-..... E. F. W. Alexanderson
Motor-control system.....J. A. Seede
Motor-control system.....W. Naumann
Motor-controlling device.....L. Janisch
Motor-cylinder.....D. Reid
Motors, Means for supplying air to hydrocarbon-.....A. A. Low
Mowing-machine.....W. E. Gilroy
Music-sheet turner.....J. Scholtz
Musical instruments, Pneumatic action for..... L. B. Doman
Navigation of waterways, Apparatus for..... C. Dorrity
Newspaper-holder.....G. Verges
Nut-lock.....W. L. Holloway
Nut-lock.....C. R. Mervin
Nut-lock.....W. Jacobus
Nozzle for bluing steel sheets..J. E. Carnahan
Nozzles for turbines and the like, Machine for cutting.....A. E. Chernack
Oar-lock.....T. W. Carey, Jr.
Oil-burner.....H. E. Swift
Oil, Hydraulic system for the distribution of.. L. C. Snell
Ore-classifier.....O. M. Kuchs
Ores and speiss, Treating arsenical. A. G. Betts
Ores, Treating.....H. A. Hogel
Oven, Baker's.....F. C. Busche
Package-carrier car.....L. B. Bethards
Package-handle.....E. F. Hulbert
Packaging-machines, Carton-marking attachment for.....W. H. Doble
Packing for stuffing-boxes.....F. D. Bartlett
Packing, Piston-.....G. R. Thompson
Packing, Rod-.....E. A. Menczer
Painter's tool.....G. D. Pushee
Paper dishes, Machine for making..... C. Halbreich
Pen, Fountain-.....A. J. Scritchfield
Permanent mold.....J. H. Shaw
Photographic representations of structural designs, Producing.....C. Clements
Photography, Film-pack for three-color..... F. E. Ives
Picture-exhibiting apparatus, Automatic..... G. M. Guerrant
Picture machines, Cylinder-roller film-steadier for moving-.....J. L. Hammond (Reissue)
Picture machines, Phonographic attachment for motion-.....G. Hammett
Picture taking and projecting apparatus, Combined moving-.....R. L. Watkins et al
Pile-covering, Concrete.....J. S. Kimball
Pipe-coupling.....C. A. Blessing
Pipe-coupling.....J. M. Cameron
Pipe-joint, Flexible.....W. A. Greenlaw
Pipe-stems, Detachable mouthpiece for..... R. L. Reed
Pipes, Device for preventing the return of waste into water-supply.....R. Stickdorn
Pistol, Liquid magazine-.....T. G. Hamilton
Pitman.....J. A. Wilson
Planimeter.....W. F. Durand
Planing-machine.....J. R. Blakeslee
Planter.....U. Flannigan et al
Planter.....C. Reutzel et al
Planter, Potato-.....W. Throener
Planter, Seed-.....M. L. Smock
Plow.....J. McEntee
Plow.....N. L. Lindesmith
Plow attachment.....J. I. Ellis
Pneumatic-despatch-tube apparatus..... A. W. Pearsall
Pneumatic-despatch-tube-apparatus carrier..... A. W. Pearsall
Pole, Sheet-metal.....H. A. Ruggles
Potato-digger.....J. R. Cook
Potato-digger.....H. Cook
Power-jack.....H. R. Hardenburg et al
Presses or other operating devices, Machine for feeding blanks or sheets to. C. E. Sargent et al
Pressing and sealing mechanism...E. E. Flora
Printing-machine.....F. E. Blaisdell
Printing-press.....L. A. Wheat
Printing-press, 2 pats.....E. O. Cartwright
Printing-press.....C. S. Evans
Printing-press.....A. Hewitt
Printing-presses, Guard for platen....J. Farrar
Printing, Registering cuts for color..... C. B. Howe
Pruning appliance.....A. S. Kleinsmith
Pulverizer.....A. F. Peterson
Pump.....M. Laux
Pump, Deep-well.....E. A. Hardison et al
Pump for deep wells.....F. W. Krogh
Pump-operating mechanism..... H. C. Longenecker et al
Pumps, Overflow-stop for lift and force..... E. Noppel
Punching and shearing machine..F. W. Miller
Purse.....J. M. Sundean
Putting-out machine.....F. J. Perkins
Quill substances, Machine for treating..... W. Webster
Rail-chair.....W. H. Coffman
Rail-joint.....E. A. Kimball et al
Rail-joint.....B. G. Braine
Rail-joint.....J. M. Cunningham
Rail-joint.....W. Wright
Rail-joint lock.....H. L. Mason
Rail support and securing device..E. R. Inman
Railway block system.....G. W. Nistle et al
Railway-frog.....G. C. Lucas
Railway-rail joint.....G. Wilson
Railway-rail joint.....J. A. Jones et al
Railway-tie, Metallic.....H. A. Beach et al
Railway safety device.....S. H. Harrington
Railway-signal, 2 pats.....J. S. Hobson
Railway-switch.....P. Goldath
Railway-tie.....R. G. Bullard
Railway-tie and rail-fastening, Cement..... A. Warfield
Railway-track.....H. O. Keferstein
Railway-track construction....J. H. F. Schulze
Railway-trains, Operating.....A. Beamer
Rake-tooth, Removable.....H. V. Smith
Range, Cooking-.....H. M. Smith
Razor-blade stropper.....H. Goldsmith et al
Razor, Safety-.....J. Stolper
Razor, Safety-.....G. H. Hamilton
Receptacle and blank therefor.....J. B. Miller
Recording instrument.....J. Harris
Reflector.....W. H. Spencer et al
Refractory material and producing same..... C. L. Norton
Registering device.....E. Nicholson
Resealing-trap.....H. J. Luff
Resilient wheel.....W. L. Martin
Rice-hulling machine.....G. H. A. Lyford
Road-repairing machine.....W. G. Herring
Roasting-furnace.....H. A. Hogel
Rock-drill making and sharpening machine.... G. W. Smith
Rocker and Morris chair, Combined standing.. A. L. Haley
Rolling-mill.....J. R. George
Roof-plate and attic foul-air vent...J. L. Fruin
Rotary drill, Portable.....J. G. St.Germain
Rotary engine.....F. D. Kelly
Rotary engine.....W. S. Ferguson
Rotary motor.....A. Brauer
Rotary motor or pump.....H. M. Dowling
Rotary steam-engine.....F. J. Waters
Rubber footwear, Making.....E. A. Saunders
Ruhber overshoe and fastening device therefor L. Reed
Rug-hanger.....R. W. and R. M. Kolini
Ruling-machine.....R. C. Stevens
Ruling-machine perforating attachment..... J. W. Ball
Sad-iron-edging machine.....R. H. Dorsey
Safe, Coin-.....W. T. Gordon
Samson-post.....T. J. Oney
Sash lock, Window-.....A. C. J. Roy
Saw, Power hack-.....R. C. Berry
Saw-tooth-setting-machine, Automatic..... C. S. Tufenkjian
Sawing-machine.....D. A. Kennedy
Scaffold.....G. R. Earnest
Scissors or shears.....J. H. Krouse
Scraper.....A. B. Munson
Seal, Box-.....E. J. Brooks
Seal-lock.....P. Stover et al
Sealing machine, Envelop-.....A. F. Roberts
Seeder, Hand-....S. B. and J. F. Rittenhouse
Self-cleaning comb.....J. J. Rauh
Sewing-machine-looper movement..... L. Onderdonk
Sewing-machine motor.....J. Albright
Sewing or work basket holder....F. H. Wilson
Shade and lace-curtain holder, Combined window-.....J. O. Anderson
Shade fixture, Window-.....F. W. Lowe
Sharpener for shears and scissors. M. E. Ingram
Sharpener, Skate-.....D. B. Dow
Shaving-cup.....H. P. Cook
Sheave-block.....J. T. Kelley
Sheet-metal-corrugating machine..S. T. Walton
Sheet-metal-pressing die.....C. F. Steiber
Shipping-can.....J. H. Chidester
Ships in foggy weather, Device for controlling the course of.....J. Orlay
Shock-carrier.....H. Christianson
Shoe-form.....G. A. Minzy
Shoe-form, 2 pats.....M. B. Reach
Shoe-tree.....W. L. Kohler
Shoe-tree and display-form, Ventilating..... R. H. Boyd
Shoe tree and stretcher, Combined..... A. Spielman et al
Show-case.....H. B. Joyce
Show-case.....J. H. and J. W. Leslie
Shuttle mechanism.....I. Larsen
Sign.....C. C. Townsend
Sign, Electric.....F. D. Ammen
Sign, Illuminated. R. R. and W. K. Wiley et al
Signal device.....F. S. Dombrowski
Signaling system.....J. G. Nolen
Sizing and shaping.....A. F. Rockwell
Smoke-stack.....N. M. Scharnberg
Snap-fastener member.....G. A. Holmes
Spacer.....J. M. Campbell
Spark-indicator.....F. W. Brandow
Sparking plug for hydrocarbon-motors..A. A. Low
Speed-controlling device.....C. E. Palmer
Speed-indicator.....A. L. R. Ellis
Spike.....C. D. Walcott
Spinning, twisting, and doubling machinery... S. Z. de Ferranti
Spoon-rest.....E. Wallace
Spraying device.....T. P. Watson
Spring-controller.....H. A. House
Spring-wheel.....J. E. Rielly
Spring-wheel.....J. D. Sower
Square, Folding.....E. Bennett
Staking-machine.....F. J. Perkins
Stall-floor.....J. W. Fargo
Station-indicator.....C. H. Duede
Steam-generator, Petrol-heated. M. A. Normand
Steel, Manufacture of open-hearth..... T. S. Blair, Jr.
Stiffening materials, Machine for preparing... W. Webster
Stills, Cut-off gate for..... R. W. Southerland
Stitching horse, Harness or leather..... H. J. Bowman
Stone composition, Artificial-..E. W. Anderson
Stone or rock channeling machine.....A. Ball
Storage and dispensing vessel....G. E. Walton
Stove attachment.....C. A. Notman (Reissue)
Stove-door latch, Gas-.....R. Hoffman
Stoves, Manifold for gas-.....W. Thompson
Stovepipe.....E. Lohsand
Strainer stopper, Sink-.....S. E. Horner
Street-cleaning machine.....J. E. Briggs
Stud, Metallic partition-.....H. I. Jeffers
Stud-setter, Automatically-opening..... F. A. Errington
Sulfur, Recovering.....W. Field et al
Supporting device.....H. Bagaason
Switch.....W. J. Clark
Switch-stand.....H. H. Lloyd
Syringe.....E. T. Pearl
Table-slides, Making steel.....O. G. Franks
Tam-o'-shanter and hood, Combined. O. Hurlbert
Target.....A. Muller
Telegraph transmitter, Wireless-..L. De Forest

Telegraph tuning device, Wireless.....L. De Forest
Telegraphic instrument.....J. J. Ghegan
Telegraphy, Space.....L. De Forest
Telegraphy, Wireless.....L. De Forest
Telephone-connecting apparatus..E. C. Molina
Telephone-exchange system, Call-distributing..S. H. Browne
Telephone-exchanges, Automatic ringing-circuit and apparatus for.....R. H. Manson
Telephone-jack.....A. L. Sohm
Telephone system.....J. M. Latimer
Telephone-transmitter.....C. Adams-Randall
Telephony, Space.....L. De Forest
Telescope.....W. S. Stockwell
Tennis apparatus.....G. W. Senn
Thermal cut-out.....F. D. Reynolds et al
Thermometer.....R. W. Mattox
Threshing-cylinder tooth.....T. Dagel
Tire.....C. L. Schwartz
Tire.....K. Karlström et al
Tire-adjuster.....A. A. Long
Tire-armor.....W. J. Belyea
Tire-filling compound.....F. M. Willett
Tire pressure-gage, Pneumatic.....C. R. Twitchell
Tire-puncture-indicating device..J. L. Marmaud
Tire, Vehicle.....B. C. Swinehart
Tire, Vehicle.....J. G. Cramer
Tires of automobiles and other vehicles, Means for securing the.....A. J. Michelin
Tobacco-box.....C. R. Hope
Tobacco-pipe.....J. E. Irving
Tobacco-pipe.....H. R. White
Tool-holder.....G. R. Lang
Tool-holder.....I. Larson
Toy.....H. T. Trimbur
Track construction.....W. A. Braden
Track-gage.....P. S. Roller
Track-sanding apparatus.....I. A. Gibbs
Traction-engine.....D. T. Timberlake
Traction-wheel.....C. M. Bell
Transmitting apparatus, 2 pats...H. Shoemaker
Transom draft-gear.....E. P. Kinne
Trap-shooting, Scoring-machine for.....C. F. Stewart
Trough.....J. S. and J. B. Weaver
Truck, Car.....W. S. Adams
Truck, Car.....O. Hochberg
Tub-carrier.....F. E. Whitney
Tube-mill for cement, stones, &c..I. A. Kneeht
Turbine.....E. I. Braddock
Turbine.....J. H. Bolitho
Turbine, Elastic-fluid.....B. Ljungstrom
Turbine, Elastic-fluid, 2 pats.....H. L. Barton
Type-casting machine.....H. H. Hardinge
Type-writer and music-printer, Combined.....G. M. N. Lafarie
Type-writers, Ink-fountain attachment for.....W. E. Phillips
Type-writing machine.....E. E. Barney
Type-writing machine.....C. B. Yaw
Type-writing machine.....J. C. McLaughlin
Umbrella for use as a boat.....S. Ettinger
Universal joint.....H. Vanderbeek
Valve.....H. Hall
Valve.....H. Lippold
Valve.....G. A. Blake
Valve.....A. Paul
Valve.....R. H. Chalk
Valve.....F. Glass
Valve.....W. R. Thomas
Valve and chamber therefor, Water-cooled furnace.....W. R. Palmer
Valve, Flushing-tank.....B. Dale
Valve for flush-tanks, High-pressure reducing and noiseless.....A. G. Virckler
Valve-guard.....W. Thompson
Valve, Hot-blast.....M. L. Rowe
Valve mechanism, Blowing-engine.....B. V. Nordberg
Valve, Mixing.....W. G. Newton
Valve, Non-return stop.....N. C. Locke
Valve, Pressure-regulating.....F. N. Labelle
Valve, Trough.....B. I. Mauldin
Valve-truing tool.....A. S. Noonan
Valves, Adjustable bearing for..G. B. Petsche
Valves, Hydraulic operator for gate.....D. P. Moore
Vase, Self-watering flower.....C. D. Jackson
Vegetable-washer.....A. M. Jensen
Vehicle and truck, Motor.....F. Lüthke
Vehicle-controlling device.....R. Werkner
Vehicle-gear.....F. J. Paxton
Vehicle, Motor.....G. T. Glover
Vehicle, Motor.....A. W. Harpstrite
Vehicle steering-gear..S. D. and H. T. Latty
Vehicle-wheel.....J. W. Thompson
Vehicle-wheel.....J. Sinnott
Vehicles, Means for reducing air resistance on..G. A. Ahrens
Vending machine, Paper...W. A. Kraemer et al
Ventilator.....J. Jacobs
Veterinary dental implement.....J. P. Kiefer
Vise, Drill.....J. C. Scoggins
Wagon-boxes and racks, Means for detachably connecting.....H. S. Swan
Wagon, Dumping.....J. E. Briggs
Wagon, Log and lumber.....J. H. Anthony
Wagon-reach, Extensible.....A. Davis
Wagon, sled, and the like, Child's..E. M. Henle
Wagon wheel-brake, Dump.....L. Boucher
Wainscoting.....C. B. Allen
Wall-plug.....F. M. Marshall
Warp-beam head.....T. J. Sands
Washing device, Clothes.....G. B. Wilson
Washing-machine.....J. C. Simmons
Washing-machine.....D. W. Phillippy
Waste, Combination.....J. L. Fruin
Water-closet valve device.....P. J. Madden
Water-heater, Electric.....H. W. Dennard
Water-purifying apparatus.....M. Miller
Water-purifying apparatus.....G. Pfeiffer, Jr.
Waxing and scouring pad.....G. B. Watson
Weaner, Calf.....W. Mann
Weirs, &c., Arched construction of.....W. H. Shields
Welt.....G. E. Rollins
Welting-machine.....J. Larsen
Wheel.....J. G. Maxwell
Whip-lock.....A. B. Bartlett
Winch, Portable.....C. Wick
Window.....A. E. Gould
Window-ventilating device, Store....B. F. Beck
Window-washer.....W. H. Bebout
Wire-bound box.....C. C. Mengel
Wire-frame machine.....A. Pieser et al
Wire receptacle.....L. H. Riddle
Wire-stretcher.....B. Graham
Wire-stripper.....A. J. Furlong
Woodworker's clamp.....A. W. Offineer
Work-table for presses and the like.....R. J. Gibbon
Woven fabric.....R. A. Hammond
Wrench.....J. F. Roehm
Wrench.....J. S. Nicholson
Yoke, Safety ball-bearing neck...J. P. Wilson

DESIGNS.

Badge.....R. Alford
Badge.....A. Armstrong
Badge.....L. S. Lee
Button.....R. Liebmann
Button.....C. Stoeter
Clock-case.....B. A. Chubbuck
Dial.....L. H. Starkey
Hammock, Couch.....I. E. Palmer
Inkstand.....S. E. Hilles
Number and door-bell push-button, Casing for combined illuminated house...R. J. Tugwell
Spoon, fork, or similar article...H. P. Rogers
Spoon, fork, or similar article.....S. Stohr
Spoon, fork, or similar article..G. L. Crowell, Jr.
Spoons, forks, or similar articles, Handle of..W. C. Codman
Spoons, forks, or similar articles, Handle of..T. Heath
Talking-machine sounding-board..L. P. Valiquet
Toy figure.....B. M. Pessinger
Woven edging.....E. Rumpp

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Acceleration-controlling device..V. A. Wolcott
Adding-machine.....A. R. Jennings (Reissue)
Adjustable clamp.....E. Buswell et al
Advertising device.....R. Hagen
Aerial device.....L. Ruppin
Aeroplane.....J. Seiler
Air-brake systems, Angle-cock support and lock for.....W. E. Sharp
Air-liquefier.....J. F. Place
Alloys of zinc with copper, Making..S. Elliott
Antisiphon-trap.....G. O. Miller
Arc-shade for gas illumination and other uses..M. Herskovitz
Atomizing, &c., Method of and apparatus for..A. Sala
Automatic switch.....I. Dyer
Automobile curved-road illuminator..D. W. Wells
Automobile fender or life-guarrd.....J. A. Harris, Jr.
Automobile frame suspension..E. C. Shumard
Automobiles, Reclining-seat for.....J. S. Lord
Axle device, Differential.....L. R. Hibbard
Baker's peel.....H. B. Jones
Balance-wheel staff.....C. M. Joye
Baling-press.....W. S. Livengood
Band-saw knife for trimming shoes.....W. B., C., and C. P. Keighley
Basket, Work.....F. D. Miller
Bath apparatus, Vapor.....B. Andersen
Battery-grid.....J. K. Pumpelly
Beam, Pilot.....C. C. Hogen
Bearing, Ball.....H. Borchardt
Bearing for rotary journals, Counterbalanced..G. P. Herrick
Bearing, Shaft.....R. F. Halliwell
Bed-bottom, Spring.....T. Klipfel
Bed, Settee.....J. Phillipson
Belt, Safety.....G. L. Dennerline
Belt with standing sides, Endless traveling....G. Gates
Bicycle.....G. H. Meiser
Bicycle-prop.....E. F. Williams et al
Binder sheaf-carrier.....J. G. Pillow
Binder, Temporary.....W. S. Mendenhall
Blind, Awning.....W. D. Williams
Blind operator, Window.....W. J. Sterling
Boat construction.....W. H. Cole
Boiler furnace, Steam.....O. D. Orvis
Boiler-plug, Collapsible..W. D. Shonefelt et al
Boiler-stand.....P. F. Murphy
Boilers, Forming openings for washout-plugs for.....H. B. Ayers
Bottle-blowing machine.....S. E. Winder
Bottle-cleaning machine.....O. Eick
Bottle-closure and stopper-extractor, Combined.....C. J. Korndorfer
Bottle holder, Milk.....W. L. Johnson
Bottle-locking bar.....S. M. Heulings
Bottle-stopper.....W. L. Bodman
Bowl-holder.....A. S. Frambach
Bowl-holder.....C. M. Haynes
Box.....F. Jager
Box-fastener.....T. S. Tobey
Box-form, Adjustable.....H. De Smith
Box-staying-machine folder.....H. De Smith
Brake mechanism.....C. A. Burke
Brake safety device, Car.....H. S. Foster
Breech-closure.....M. Hermsdorf
Brick-anchor.....C. A. Londelius
Brick-cutting machine.....J. C. Ross
Brick-press off-bearing attachment.....W. R. Cunningham
Bridle-rosette.....C. C. Bailey
Bristle-bunching machine.....H. H. Cummings
Brush.....G. Pavlik
Brush, Shaving.....W. H. Lopp
Buckle.....G. H. Nearing
Buffing device.....M. H. Ballard
Buffing-machine.....P. B. Taylor
Buggy top and curtain.....E. C. F. Becker
Buildings, Sheathing metallic frames of.....G. Webster
Butter, &c., Machine for cutting..D. M. Lemon
Button-fastener.....A. Mickihs
Cabinet, Check.....D. E. and E. H. Ingle
Cake-coating machinery..G. I. and C. E. Mossop
Calculating-machine.....F. Trinks
Calculating sheet, Interest and time.....W. Sparklin
Camera.....A. W. Straight
Candle or lamp holder.....W. W. Katterjohn
Cane-stripper.....T. J. Peters
Canning apparatus.....J. F. McIlvaine
Can-opener.....E. Morse
Can-opener.....R. Braun
Cans, Detachable spout for shipping.....G. W. Weber
Car-aisles, Means for preventing congestion in..A. J. Breda
Car and train-pipe coupling, Combined.....R. Rittenhouse
Car brake-beam, Railway.....W. I. Eckert
Car-door construction.....L. Mills
Car draft-rigging, Railway.....W. J. Mack
Car, Dumping.....E. C. Sherman et al
Car grain-door.....W. S. Williams
Car grain-door.....L. P. Roberts
Car running-gear, Mine.....J. M. and R. F. Phillips
Car safety apparatus, Motor..J. Barberie et al
Car-step, Extension.....D. Jones
Car, Street.....C. B. Priee
Cars, Extension hanger-strap for street.....H. Murray
Carbureter.....N. T. Harrington
Carbureter.....M. Laux
Carbureter, 2 pats.....J. S. Goldberg
Carriage, Folding.....A. W. Loshbough
Carton, Cell.....J. H. Carter
Caster.....F. Villiers
Casting apparatus, Pressure...R. N. Le Cron
Casting-ladle.....D. Collier
Ceiling-hook.....H. L. Bradley
Chair.....U. S. De Moulin
Chair.....H. E. H. Collings
Chair-rocker.....G. M. Stratton
Chalk-line holder.....J. G. Hall
Chandelier attachment.....G. J. Murphy
Check holder, Transportation.....W. H. Carroll
Chuck.....H. L. Davison et al
Chuck, Adjustable angle.....F. L. Crouse
Chuck, Tool.....J. P. Bartholomew
Cigarette and like paper holder....W. S. King
Cistern-mold, Collapsible.....D. Laughlin
Clock or similar mechanism, Electric apparatus for driving.....H. E. Warren
Clock, Ship's-bell.....P. Lux
Clod-cutter.....G. W. and J. L. Voelkel
Closet-bowls, Manufacturing siphon.....C. B. Walton et al
Clothes-cleaning apparatus.....A. R. Kezer
Clothes-line holder.....R. Kummer
Clothes-pin.....J. A. Freese
Clothes-pressing apparatus.....A. J. Hoffman
Clothes-rack arms, Cabinet for....A. A. Taylor
Clothes-stick.....J. Johnson
Coal-cutting machine.....E. Jones et al
Coat.....M. A. Adler
Coated article and making same.....H. Shoemaker et al
Coffee-mill.....B. C. Holwick
Coiling-pipe.....L. C. Schneider
Coin-freed machine.....C. E. Hibberd
Collapsible box.....R. P. Brown
Collar.....G. W. Slifer
Collar and cuff edge-finisher...E. J. McCauley
Collar pad, Horse.....J. W. Foster
Compression stop and waste..A. C. Schuermann
Concrete cattle-guard, Reinforced.....J. H. Hammill
Condenser and making same, Electrical.....H. Shoemaker et al
Condenser, Steam.....G. Hartman
Connecting-slide.....B. C. Rockwell
Controlling and locking device....G. F. Larkin
Conveyer.....C. D. Seeberger
Conveying system.....W. R. Cunningham
Cooking utensil.....M. Geig
Cooking-vessel lid-holder.....J. C. Landkrohn
Cooling apparatus.....K. Nakagawa
Core-making machine.....F. C. Francisco
Core-slitting machine, Cabbage.....A. D. Wagenhauser et al
Corn rack, Seed.....M. L. Henderson
Cotton-chopper.....H. B. Deken
Counting-machine.....F. Spence
Coupling.....E. G. Johnson et al
Coupon cutter and counter.....E. H. Bartow
Cradle, Child's.....H. Levin
Crane, Floating.....A. Bode et al
Cranking-handle.....G. J. Dallison
Cross-arm fitting and insulator-support.....S. B. Way
Cross-head, Safety.....K. M. Dahl
Cultivator.....R. H. Griffith
Cultivator.....E. J. Craig
Cultivator.....R. L. Stalans
Cultivator attachment, Corn.....H. J. Neff
Cutlery.....J. Heissenberger
Cycle-lock.....J. M. Barrett
Dental appliance.....J. Gartrell
Dental-silk receptacle.....H. Emerson
Depth-recorder.....J. W. Gillie
Derrick, Portable.....C. H. Roberts
Desk attachment, School.....A. S. Baylor et al
Desk, Convertible office.....J. G. S. Dey
Dish-washer.....J. E. Walter
Dish-washing machine.....R. R. Parry
Disintegrating-cylinder.....J. Dixon
Dispensing apparatus.....F. W. Williamson
Display-cabinet.....F. S. Woldridge
Distributer and timer device, Combined.....T. M. Mueller et al
Distribution system.....P. Rose
Door and fastener, Silo.....K. Kleven
Door-hanger.....W. R. Lewis
Doors, Closing device with stop for swinging..A. Damitz
Dough, Machine for the transport of.....G. S. Baker
Draft device.....H. Barber
Drain connection.....E. L. Dawes et al
Drawing-table.....G. H. Grove
Dredging-machine.....J. W. Singleton
Drilling-machine.....T. Hargie
Drilling-machine.....C. B. Richards
Driving mechanism.....H. A. Sandor
Drying-machine.....C. Jordan
Dye and making same, Sulfur vat..B. Mayer et al
Dyeing-machine.....J. Richardson et al
Educational device.....J. Davis
Elastic composition.....E. K. M. Holst
Electric machine, Dynamo.....W. H. Frost
Electric-switch-controlling system.....F. G. Proutt
Electric-switch instrument.....C. W. Coleman
Electric time-switch.....O. A. Bruun
Electrical energy, Means for utilizing, 2 pats..T. F. Perkins
Electrolyzer.....E. Hixon
Electromagnets, Construction of.....H. Lacy
Elevator automatic safety-stop....A. J. Dawe
Engine-cylinder-cooling device....S. W. Zent
Engine-lubricating device.....A. Krebs
Engine starting device, Internal-combustion..W. H. Rozier et al
Engines and the like, Apparatus for removing dust and foul gases from carding.....H. Smethurst
Envelop-check, Manifolding.....A. L. Irvin
Engines, Mechanism for controlling the operation of internal-combustion.....W. J. McVicker
Engraving-machine, Pantograph, 2 pats.....J. T. Rawsthorne et al (Reissue)
Evaporating apparatus.....W. and A. Gaulin
Exercising-machine.....J. F. Vanderboss
Extension-table.....M. Finholm
Extension-table.....A. G. Wettergren
Eyeglass-clip.....W. G. King
Eyeglass-mounting.....T. E. Carpenter
Farrier's tool.....A. I. Merrifield
Fastener.....A. C. Leahy
Faucet.....M. J. Ryan
Faucet.....H. M. Alderfer
Faucet, Electrically-heated water.....F. A. Robinson
Faucet or street washer, Antifreezing.....J. T. Hartnett
Faucet, Time.....T. E. Beardsley et al
Fence-post, Metallic.....F. A. Colver
Fence-wiring clamp.....L. C. Hinkle
Fertilizer-distributer.....W. J. Adams
Fertilizer-distributer.....E. Buswell
Fertilizer-distributer, 2 pats...E. Buswell et al
Fiber-treating machines, Feeding mechanism for.....J. N. Selvig
Filter.....F. Sellenscheidt
Filter.....J. W. Morrison
Fire-brick lining, basic.....S. B. Newberry
Fire-door lock.....R. M. McCoy
Fire-escape.....T. R. Anderson
Fireproof construction.....W. F. Potthoff
Fish-stringer.....J. Dineen
Fish-trap.....F. J. McEwan
Floor-dressing machine.....G. J. Kepplinger
Floor-scraper attachment.....J. Miotke
Flowers, candles, &c., Holder for.....C. L. Patterson
Flue-protecting shield, Furnace.....H. W. Lash
Fluid-brake.....F. Böminghaus
Fluid translation device.....R. N. Ehrhart
Fluids under high pressure, Transferring apparatus for.....J. A. Hoff
Flushing device.....F. F. Hawkins
Folded-corner can or vessel, 2 pats.....J. M. Hothersall
Food-warmer.....R. W. Munn
Foods, &c., by liquid air, Apparatus for cooling and preserving.....J. F. Place
Fuel-pan.....T. D. Bausher
Funeral-cars, Body for auto..J. W. Butler et al
Funnel.....W. Lewis
Furnace.....C. Kroeschell
Furnace regulator and radiator, Combined.....F. S. Harmon
Furnaces, Change-over device or valve for Siemens-Martin or other regenerative.....G. von Beehen
Fuse with double action.....J. Harlé
Gage and marking device.....A. Veitch
Game.....B. B. Bennett
Games, Annunciator for checkers or similar.....A. Nelson
Garment fastener and supporter..H. K. Walker
Garment-hanger.....J. T. Viganego
Garment-supporter clasp.....J. C. Copeland
Gas-analyzing apparatus.....G. V. Cederborg
Gas, Apparatus for converting volatile hydrocarbons into fixed.....H. F. Smith
Gas-burner.....S. T. Wilson
Gas-fixture.....W. E. Otstot
Gas generator, Acetylene..G. H. Emerson et al
Gas generator, Acetylene.....E. E. Miller
Gas generators, Feed for acetylene.....J. Boland et al
Gas-lighting apparatus.....R. M. Dixon
Gas-mantles, Holder for incandescent.....A. Martini
Gas, Manufacturing.....B. Brazelle
Gas or vapors to the action of liquids, Apparatus for subjecting.....C. H. Fowler et al
Gas separator, Natural.....A. W. Barker
Gate.....J. B. Bullock
Gate.....M. Effland
Gearing, Controlling mechanism for variable-speed.....J. F. Warner
Glass-tank furnace.....R. H. Bolin
Globe-holder.....R. M. Dixon
Governor for internal-combustion engines, Electromagnetic.....E. Hubbard
Grader, Road.....W. S. Livengood
Graphophones, Speed-changing mechanism for..F. F. Murdoek
Grate for drying purposes, Basket.....A. Wien
Grate, Rotary.....T. Kaufman
Greenhouse construction....J. F. M. Farquhar
Grinding-machine drill-rest.....P. E. Shee
Ground, Machine for preparing and ridging corn.....A. P. Gubrud
Gun attachment, Shot.....O. E. Michaud
Gun barrels, Transport-carriage for portable recoil.....H. Kánonenberg
Gun-protecting shield.....O. Lauber et al
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Guns, Fluid-brake for recoil....O. Lauber et al
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Handle.....R. R. Brakeman
Harness.....C. R. Austin
Harrow.....P. Hari
Harrow attachment for plows.....C. H. Myers
Harrows, Lock-jointed foldable draft-beam for sectional.....E. C. Clausen
Harvesting machine, Corn.....W. H. Tilson
Harvesting machine, Corn.....E. Laking
Hat-badge.....H. F. W. Arnold
Hat-pin.....R. V. Skinner
Hats of straw, palm-leaf, and the like, Manufacture of.....H. P. Pearson
Hay, Device for transporting and weighing baled.....E. McGlinchay
Hay-fork, Double-harpoon.....P. A. Myers
Hay-press.....S. Carr
Hay-sweep.....J. A. Schertz
Headlight.....C. L. Betts
Heating by aid of vacuum, System of.....C. C. Peek
Heating system.....E. H. Gold
Heating system, Low-pressure fluid..E. H. Gold
Heel-cushion.....M. B. Crane
Hoisting-cylinder.....M. F. Berry
Hog-ring.....R. Roethlisberger
Horseshoe.....A. Kerry
Horseshoe-calk.....H. W. Schoen
Hose-coupling.....M. G. Otis
Hose-nozzle.....E. C. Delene
Hose-pipe.....W. R. Calvert
Hose-rack, 2 pats.....R. D. Wirt
Hot-air furnace.....C. A. Simonton
Husking-roll.....A. Rosenthal

Hydraulic pipe....J. T. Langford
Igniter deviee, Electric....L. Baskin
Ignition systems, Induction-coil for....B. L. Lawton
Incubator....H. H. Charles
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Index-box....B. L. Roberts
Indicating mechanism....C. W. Canine
Insulating-stud....L. E. Underwood
Insulator-support....F. Woodmansee
Insulators, Manufacture of spar-....F. M. Locke (Reissue)
Invalid's chair....E. E. Higgins
Iron a product having cutting and other properties of high-grade tool and high-speed steel, Producing from foundry-....E. A. Custer
Iron, Metal product from cast-....E. A. Custer
Iron or steel for casting, Preparation of....P. Rakowicz
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Jar-closure....J. E. Barranger
Jewelry-catch, Safety....A. O. Burgess
Joint connection, Knuckle-....M. Kelly
Journal-bearing....L. J. Aldridge
Key-fastener....W. Curlett
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Kitchen implement....G. Konigstein
Kite, Box-....C. Gruber
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Knitted fabric....R. W. Scott
Knitted fabric, Ribbed....R. W. Scott
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Lacing-hook-setting machines, Spacing mechanism for....W. F. Fraser
Ladder....O. Colborne
Lamp, Arc-....G. E. Stevens
Lamp, Arc-....R. Fleming et al
Lamp, Central-draft incandescent oil-....C. Blankenburg
Lamp filaments, Manufacturing electric-....W. von Bolton
Lamp, Incandescent gas-....H. Blau
Lamp, Incandescent petroleum-....A. B. Krzywiec
Lamp safety attachment....A. Karnat
Lamp socket and bulb remover and replacer, Electric-....D. L. Webb
Lantern, Tubular....C. Bergener
Lanterns, Bail-holder for....F. K. Wright
Lanterns, Operating means for signal-....O. R. Milliron
Latch for doors, gates, windows, &c....B. R. Crampton
Latches, Emergency-exit attachment for knob-....A. M. Hood
Lathe-head....G. F. Fisher
Lathe-stocks, Means for securing movable....C. D. Young
Lathe structures or the like, Controlling mechanism for....F. Hardinge
Laundry articles, Marking machine for....C. W. Canine
Leather goods....S. Zeugschmidt
Leather or artificial patent-leather, Making patent-....G. R. De Montlord
Leather-staking-machine table....F. F. Slocomb
Legging-fastener....M. H. Marcus
Lens-grinding machine....B. F. Clark
Lid, Short center....H. C. Goeltz
Lighting system....W. L. Bliss
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Limb knee-joint, Artificial-....J. H. Jepson
Liquid-cooling apparatus, 2 pats....F. Bauer
Liquid-dispenser....S. Lippstadt
Liquid-fuel-heating burner....M. Greatz
Liquid-receptacles, Locking and controlling device for....J. G. Williams
Liquid-separator, Centrifugal...P. L. Kimball
Liquids, Apparatus for filling receptacles with....D. Landau
Liquids, Regulator for the flow and level of....P. Sutherland
Lithographic stone artificially, Manufacture of....T. M. Thom
Locomotive attachment....C. E. West
Loom-shuttle....I. Snow
Looms, Pick-matching mechanism for automatic weft-replenishing....C. H. Leitner et al
Luggage-carrier....L. E. Draper
Magnet, Lifting-....A. C. Eastwood
Mail-bag....W. A. Carpenter
Mail-bag crane....G. J. Ford
Mail-box signal, Rural-....W. E. Hart
Mail-box support....H. Skreberg
Mail carrier, Rural-....G. B. Clark
Mantle-holder....A. Herskovitz
Manure collector and conveyer....M. J. Hager
Manure-loader....C. Dieleman et al
Manure-scraper....C. Dieleman et al
Marble, Artificial....J. Mitats
Mashing-machine....A. R. Keller
Massage-tool....H. A. Grass
Match-safe....E. A. Bolen
Matrix making and drying machine...A. Waldt
Mattress-carrying device....E. Donner
Measure, Tailor's....M. Ciervo
Measuring-cover for cans....R. Hirsch
Measuring device, Skirt-....E. F. Stenman
Measuring instrument....A. Giannousis
Medicaments, Atomizing solid....G. Fuscb
Merry-go-round....H. C. Draper
Metal mold, Permanent two-part..R. A. Pitman
Metal pieces, Apparatus for centering symmetrical....K. A. Soderstrom
Metals and metalloids from lead and copper slags, Recovering volatile....W. Witter
Microphone....G. Angelini
Milking-machine....L. L. Story
Milling machine....A. L. De Leeuw
Mining, Apparatus and method for..C. A. Bray
Molder's flask....E. T. McHugh
Molders' flask, Mateh-plate for..E. T. McHugh
Molding-polishing machine....A. Stake
Mosquito-bar frame....J. G. Malaby
Motor controller, Electric-...V. E. Cbamberlin
Mowing-machines, Brush-cutting attachment for....J. C. Stevens
Musical instrument, Self-playing.F. W. Draper
Musical instruments, Expression device for mechanical....J. O'Connor
Musical instruments, Mechanism for playing....I. B. Smith
Mustaehe-guard....C. A. Steele, Jr.
Necktie....W. A. Keys
Nut-tapping and other machines, Automatic feed-hopper for....F. C. Tyler
Nut-tapping machine....F. C. Tyler
Oarsmen's apparatus....J. H. Cunningham
Oil-burner....A. H. Light
Oiler, Windmill-....H. A. Mowrey
Oiling device, Saw-....J. and H. Schuring
Operator's key....R. H. Manson
Ore-dressing machines, Slime-breaking attachment for....J. O. Dimmick
Organs, pianos, &c., Key for....G. L. Cheney
Oxids, Producing....H. L. Doherty
Ozone-generator....T. Friedlander
Package cover or receptacle...A. S. C. Sneath
Padlock....C. E. Johnson
Pail, Milk-....H. J. Behrens
Paint in barrels, Agitator for....W. L. Cooke
Painting apparatus....G. A. Price
Pants stretcher and presser, Combined....S. G. Austin
Paper bottles, Making....G. L. Jenkins
Paper-coating machine....J. B. Morrow
Paper pail....B. I. Rike et al
Patterns, Laying out....V. Evangelista
Pen attachment, Fountain-....R. E. Buschek
Pencil-marking machine....H. Dumars
Perforator....W. Flett
Petroleum-burner....A. Pecot
Phonograph-records, Turning and smoothing device for....F. Able, Jr.
Photographic flash-light apparatus...S. Roesner
Piano-playing mechanism, Pneumatic....G. P. Brand
Pie and cake lifting and turning device....W. C. Thompson
Pie-machine....O. Colborne
Piling, Sheet-, 2 pats....W. L. Gibb
Pin cutting and separating machine....W. B. Louthan
Pipe-cleaning apparatus, Beer-....J. R. Steiger
Pipe-coiling machine....L. C. Schneider
Pipe-coupling, Flexible metallic....W. W. Kilpatrick
Pipe-joint-forming machine....F. Deering
Pipe lifting and separating apparatus....J. L. Hendershot
Pipe-wrench....E. M. Peterson
Pipe-wrench....H. C. Ray
Planer for narrow work, Wood-....C. W. H. Blood (Reissue)
Planter....R. R. Langley
Planter attachment, Corn-....F. Fisher
Planter attachment, Corn-....E. A. Jones
Planter, Corn-....D. F. Shular
Planting-machine....R. R. Langley
Plaque-hanger....M. Kaufman
Plaque-stretching machine....A. L. Bausman
Plaster-boards, Macbine for manufacturing....J. R. Spear
Plow....P. D. Arras
Plow attachment....J. A. Batson
Plungers, Stroke-regulator for....O. H. Harrison et al
Pool-table....E. Snedaker
Powder bag and cup, Combination....C. Breitmeyer
Powder-box, Spring-top....G. F. Miller
Press for forming hollow articles.R. L. Williams
Printing directly on the surfaces of bottles, Machine for....B. W. Allen
Printing-form and making the same, Lithographic....G. G. Murray
Printing form and type....W. G. Reynolds
Printing-machine....J. S. Duncan
Printing press, Fabric multicolor-...O. Walther
Printing-press gripper....C. A. Harris
Printing-press, Rotary....H. F. Bechman
Projectile, Armor-piercing....C. Grunwald
Projectile-charging apparatus....H. Maxim
Propelling system, Vessel-....T. Motton
Propulsion, Marine....M. J. Flynn et al
Pruning implement....H. A. and R. Barnard
Puffing-iron....C. Hornberger et al
Pulley....W. R. Routt
Pulley made in two parts, Rope-...J. F. Henry
Pulp, Manufacturing wood-....C. B. Clark
Pulp-mill reclaiming apparatus...C. B. Clark
Pulp-press attachment....J. O. Hunt
Pulper....J. L. Walton
Pump, Distributing-....W. E. S. Strong
Pump for drawing and measuring liquids....H. L. Darwood
Pump for soap-dispensers....S. Lippstadt
Pump, Lubricator-....G. J. and J. J. Arends
Pump or blower, Rotary....E. Eickboff
Pump, Water-motor....B. Pickering
Pumps, Working head for power-.P. A. Myers
Pyro-electric generator....G. J. Vokel
Rail-clamp....W. Berry
Rail-joint....E. W. Gorsuch
Rail-joint....J. Fait
Rail-joint....R. H. Marsh
Rails to metallic ties, Means for securing....S. C. Berryman et al
Railway-crossings, Block system for....G. W. Nistle et al
Railway-fastening....C. H. Cornell
Railway fish-plate....J. A. Belk
Railway interdependent signal and switch apparatus....F. Prochaska
Railway, Pleasure-....F. R. and R. B. Fageol
Railway-rail tie and rail-fastening...J. Timms
Railway safety device....G. W. Weber et al
Railway signal-torpedo....F. Dutcher
Railway-switch....A. A. Long
Railway-switch lock....J. O. Hale
Railway-switch, Self-latcbing automatic....J. N. W. Porter
Railway-tie and rail-clamp, Composition....L. C. Mensch
Railway-track....L. Clark
Railway-track cattle-guard....H. Marshall
Ratchet-wrench....O. M. Weir
Razor, Safety-....C. A. O'Neill
Reflecting device and sound-conveyer, Combination....L. Weglein, Jr.
Reflectors, Supporting-socket for.W. H. Spencer
Refrigerator....W. A. Merralls
Refrigerator, Car-....W. R. Stokely
Relay....R. H. Maanson
Relay....E. R. Brodton
Resonator....P. E. Finlay
Retinning-machine....A. L. Bernardin
Ringing and talking device, Selective....C. O. Sisler et al
Road-machine....M. M. Sickler
Rock-drill....S. W. Brothers
Roof, Temporary....J. C. Gabler
Rotary engine....J. F. Bearinger et al
Rotary engine....F. Wunderlich et al
Rotary engine....F. P. Nichols
Rotary motor....A. B. Chapman et al
Rotary steam-engine....W. M. Farrow, Jr.
Rule joint, Folding-....C. Bodmer
Ruling-machine pen-clamping device.C. Burrows
Saddle mechanism, Top-roll-, 2 pats....L. T. Houghton
Sash-fastener....C. C. Harlan
Sash-lock....F. H. Woolley
Sashes and doors, Water-excluding bar for casement-....L. H. Peters
Saw-blades or other tools, Forming the clasps of the interlocking portions of extensible frames for....A. M. Remington
Saw lubricator, Hand-....C. E. Lowe
Saw-machine....P. R. Kramer
Saw machine, Power hack-....C. Rasmussen
Saw tension device, Band-..F. T. McDonough
Sawing-machine....S. M. Krawchenko
Scaffold-hanger....D. P. Chesebro
Scow, Dumping-....E. P. Eastman
Screw-drivers, &c., Operating attachment for....P. S. Peterson
Seal, Box-....W. M. Brooks
Sealing-wax pot....E. E. Saums
Seed-delinting machine, Cotton-...E. J. O'Brien
Seed-separating machine....E. H. Geise
Seed-stand....R. Nicholson
Selective systems, Sender for....F. G. Agrell
Separator....G. W. Christoph
Separator....G. R. Sherwood
Sewing-machine bobbin-thread controller....D. Mills
Sewing-machine needle-bars, Silk-feeding attachment for....J. C. Haussler
Shade and curtain guide, Window.C. F. Linck
Shade fixture, Window-....J. A. Churchill
Shade roller, Window-....W. L. Marion
Sharpening knives in clotb-cutting machines, Means for....A. A. Simon
Shock-absorber....G. C. Murray
Shoveling-board....C. A. Fleming
Shutter, Window-....F. E. Domscheit
Sifter, Flour-....I. Wantling
Signal system....E. F. Bliss
Signaling system....H. O. Rugh
Signaling system and magneto hand-generator therefor, Harmonic....R. H. Manson
Silicates of aluminum for the purpose of obtaining valuable products, Treating....A. Sinding-Larsen
Sink....E. R. Goode
Sled-propeller....W. J. Wilson
Slicing-machine....J. I. McCormick
Smoke-shade hanger....G. Bible
Snow-guard....J. Gery
Snow-plow....J. W. Russell
Sound-box, Counterbalanced..W. N. Dennison
Sounding-machine, Navigational..W Thomson
Speed-indicating machine....S. A. Campbell
Speed mechanism, Variable-...C. L. Grohmann
Speed-regulator and brake, Combined....W. N. Dennison
Speed-regulating and brake mechanism....F. C. Craw
Spinning frames, Receptacle for travelers for ring-....L. S. Burbank
Spring-bolt, Safety....D. S. Welch
Square....T. C. Howland
Square, Try-....C. G. Larson
Stacker, Portable hay-....C. V. Kahoa
Stage-noise cabinet....J. C. S. Rousselot
Stamp-affixing device....C. L. Peters
Stamp box, Postage-....P. H. Jung
Stanchion, Swing-....R. Logan
Staves, Machine for threading bands in....D. E. Vanvacator
Stay-bolts, &c., Machine for making....J. A. Eden, Jr.
Stencil-cutting machine....S. Elliott
Sterilizer....R. P. Barnstead
Stone-drill....C. E. Hall
Stove, Gas-....C. P. Hensley
Stropping-handle....J. C. Morgan
Suit, Lady's rain-....D. Hurley
Surfacing and polishing machine..J. H. Prugh
Surgical instrument....W. A. Whitlock
Sweep-rake....S. P. Martin
Sweeper, Pneumatic....A. E. Moorhead
Switch handle, Electric-....C. D. Platt
Switch-operating device....G. A. and I. F. Schwebel
Switch-stand....W. O. Hardage
Tahle locking device, Folding-....D. Buel
Table-mat....H. M. Kaylor
Tally-card....E. D. McKenna
Telegraphy, Wireless....J. H. Cuntz
Telephone coin-box....C. S. Ellis
Telephone divided multiple-switchboard system....W. Aitken
Telephone metering system....R. M. Eaton
Telephone system....M. Baumer
Telephone system, Selective....H. G. Guyle
Telephone-transmitters, Hygienic attachment for....E. C. Smith
Thill, Vehicle-....P. E. Ebrenz
Tile....J. R. Miller et al
Tile-machine....J. H. Stewart et al
Tile-mold....J. H. Stewart
Timepiece....E. Aufiero
Time-recorder, Workman's....F. G. Lake
Time-recording device....E. S. Bassett
Time-switch, Automatic....J. and J. Jones, Jr.
Tire....J. C. Barker
Tire, Armored....S. T. Moser
Tire and clamping means, Pneumatic....H. M. Hartman
Tire-protector....W. Green
Tire-protector....C. E. Kimball
Tire repair device....O. C. Reich
Tire, Vehicle-....D. Pollard
Tobacco-box, Sheet-metal pocket....W. J. Chambers
Toilet-chair....W. F. Hedstrom
Tongs....E. J. Walker
Tongue-switch....E. T. Alburger, Jr.
Tool for breaking bands, wire, and the like....J. M. Heckman
Tool-handle....C. B. Stanley
Tool-head, Rotary....A. E. Church
Tool-holder....C. Karpa
Tool, Refilling-....J. E. Graybill
Tool-shank....C. F. Sullivan
Tool, Valveless pneumatic....T. F. Clement
Toy....J. C. Turner
Toy block....L. Johnson
Toy, Detonating....J. A. Dainty
Toy, Illusion....F. L. Oleson
Transmission apparatus....J. O. Forker
Transmitter-mouthpiece....W. W. Dean
Trolley....E. Y. Moore
Trolley-harp mounting....G. L. Adams
Trolley-pole guide....J. P. Brennan
Trolley-wheel....T. A. Gannoe
Trolley-wire switch....H. O. Skissler
Trolley-wire switch mechanism....F. M. Zimmerman
Truck, Car-....F. Gebhardt
Truck construction....E. B. Dailey
Truck, Gasolene-motor....A. Kaburcek
Truck, Rigger's....J. Ross
Tube-mill....G. S. Emerick
Tubes and for other uses, Machine for straightening....L. D. Davis
Turbine, 3 pats....J. Hormby
Turbine....D. Burnfield
Turbine, Elastic-fluid....C. G. Curtis
Turbine, Steam-, 2 pats....D. Kemble
Turning and shaping tools, Holder for....B. M. W. Hanson
Type-writer ribbon-spool....J. F. O'Connor
Type-writers, Line-space indicator for....C. C. Poole
Type-writing and adding machines, Variable automatic spacing mechanism for combined....W. L. Dench
Type-writing machine....O. Woodward
Type-writing machine, 2 pats...F. W. Sickles
Type-writing-machine ribbon-spool..G. A. Seib
Typographic form....F. H. Richards
Typographic forms, Mechanism for making....F. H. Richards
Umbrella....Z. F. Dunlap
Umbrella....J. J. Bardon
Umbrella drip-cup, Detachable..R. Winkelman
Uncapping-tool....A. Rydquist
Valve....E. Phillipson
Valve....A. C. Ricksecker
Valve....C. A. Harvey
Valve, Air-....F. H. Sauer
Valve, Cap-....A. E. Moorhead
Valve, Combined emergency and throttle....J. G. Callan et al
Valve device....V. Bloom
Valve-gear and ignition apparatus for internal-combustion engines....M. Briggs
Valve mechanism....W. H. and F. M. Spayd
Valve mechanism for engines and compressors....S. A. Reeve (Reissue)
Valve, Sand-....G. H. Irwin et al
Valve, Water-pressure-regulating...E. Conley
Vapor-burner feed device....E. E. Flora
Vehicle, Motor-....J. W. Davis
Vehicle-spring....C. C. Hayes
Vehicle spring-wheel....T. S. Dunn
Vehicle-wheel....E. S. Stanclift
Vehicle-wheel, Elastic-tread....J. Murrey
Vehicles, Apparatus for regulating and controlling the speed of motor-....F. Loos
Vehicles, Hydraulic steering-cbeck for....H. Lemp
Vehicles, Track for single-rail....A. E. Davis
Vending machine, Cigar-....F. C. Kainer
Veneering-press....A. J. Kaufman et al
Vessel, Compound....E. Drouilly
Vessel, Double-walled....G. R. Paalen
Vibrator, Electrical....M. K. Golden
Vise....T. C. Massey
Wagon-brake....J. Luznicky
Wagon, Dumping-....W. Rodenhausen
Waiter, Portable....G. F. Hiil
Washboiler attachment....C. Moletor
Washing-machine....C. Jackson
Washing-machine....W. Neuner
Washing-machine....W. J. Zuill
Washtub-stand....C. Jackson
Watch, Stem winding and setting.W. E. Porter
Watches, &c., Winding and hand-setting mechanism for....H. Roost
Water-closet bowl....A. P. Finkensieper
Water-closet connection....E. L. Stallings
Water-gage....J. Torok
Water-heater....D. W. Cunningham
Water-heater....A. F. Moneuse
Water-motor....L. C. Lewis
Wattmeters, Operating alternating-current mercury....R. C. Lanphier
Weaner, Calf-....F. M. Tatman
Weather-strip....C. H. Tibbitts
Weather-strip, Metal....P. L. Hedberg
Weaving-machine....E. Reuter
Well packer, Oil, gas, and water....L. E. Robinson
Wells, Installing....H. Frasch
Wheel....J. T. Kelly
Wheel rim, Vehicle-....E. C. Shaw
Whip-socket, Locking....J. T. De Moss
Windmill....J. Barker
Windmill-governor....P. E. Anderson
Window-bracket....J. W. Flynn
Window structure....R. Linkletter
Wines under pressure, Apparatus for fermentation and decantation of sparkling....E. Charmat
Wire-cloth rack....W. S. Maxey
Wire lathing....W. J. Herald
Wire-working implement....C. J. Smith
Wool, Apparatus for supplying liquid to....W. J. Murray
Wreck-locator and life-saver, Combined....F. P. Brust
Wrench....G. C. Winslow et al
Zinc, ores, Reducing....A. H. Imbert

DESIGNS.

Brooch or similar article....O. C. Lanphear
Button....C. Stoeter
Dresser....F. O. Anderson
Jar....J. H. Schramm
Lamp, Automobile-....O. J. Holt
Lamp shade, Incandescent-....D. M. Gilbert
Leather, Embossed....A. Mittenthal
Phonograph-case....W. H. Hoschke
Picture-frame....A. Kaiserman
Shade, reflector, or similar article....O. A. Mygatt
Sign-board....E. A. Clungeon
Vehicle-body....W. H. Emond

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MECHANICAL PATENTS.

Acid, Making nitric....F. L. Schmidt
Acid, Manufacture, concentration, and simultaneous purification of sulfuric....G. C. de Briailles

Adapter....H. S. Salt
Advertising-automaton....D. F. Brown
Advertising-shade for incandescent lamps....J. de Yongh
Agricultural implement....W. L. Paul
Air, Centrifugal apparatus for separating solid matter from....A. Lebrasseur
Air-compressor....T. O. Perry
Air moistener and deflector, Hot-....W. M. Roeder
Air-mover....A. Mathis
Air-ship....S. Lake
Air-ship, Aeroplane....F. A. Newell
Alfalfa-drier....R. S. Rowland
Alkali chlorids, Electrolysis of....J. Billitzer
Anchor, Stockless....W. S. Bickley
Animal-trap....M. M. Franks
Animal-trap....G. J. Miller
Animal-trough....F. L. Stewart
Apparel apparatus....W. D. Forbes
Armature-coils, Machine for applying tape to....J. S. Downs
Armor-plates, Treating....S. S. Wales
Automatic lubricator....F. L. Allen
Automobile fifth-wheel....E. A. Oliver
Automobile-motor....M. and W. Eastman (Reissue)
Automobiles, Friction drive mechanism for....A. B. Cole
Awning guide-rod....R. Simms
Axle coupling, Car-....R. Hackbarth
Axles, Method of and means for repairing....A. F. Hunt
Baby-tender, Self-adjusting chronometric....S. F. Wilson et al
Bag-frame fastener....J. S. Isidor
Ball-cleaning device, Golf-....H. Woodward
Ball players, Training device for hase-....W. G. Lenz
Ballistic plate....S. S. Wales
Bank, Portable....B. S. Wakeman
Barbers' chairs, Paper-actuating device for....D. B. Brown
Barrel-bodies from pulp, Apparatus for making....W. H. Decker
Barrel-bodies of paper-pulp, Apparatus for making....W. H. Decker
Barrel-bodies of paper-pulp, Apparatus for forming bilged....W. H. Decker
Barrel-press....J. Teml
Basket for holding dishes and plates....A. Insinger
Bearing, Roller-....A. Schilling
Bed....A. K. Taylor
Bed, Covered....L. J. Wilson
Bedstead-mounts and the like, Machine for huffing....J. F. Gail
Beer-dispensing apparatus....H. S. Cornish
Beets, Machine for unearthing....O. N. Frankman
Bell and alarm, Combined door-....H. W. Dubbs
Bell fastener, Sleigh-....W. C. Frindell
Belt-fastener....G. H. Smith
Belt-fastener....R. M. Bennett
Bench-clamp....J. W. Kincaid
Binder, Loose-leaf....L. Streit
Block-signaling system....D. J. McCarthy
Blower, Pressure-....E. Bassler
Boat....A. E. Apel
Boiler-tube cleaner....S. M. Cockburn
Book-covers, Making....C. L. Baldauf
Bookbinder....R. J. Nicholson
Bookbinding....D. Z. Howell
Bookcase door-guide, Sectional-....F. N. Weis et al
Bottles or other receptacles, Machine for capping or closing charged....E. K. Moore
Box....W. R. Parsons
Box-lids in an open position, Means for supporting....C. Powell et al
Box-top....W. H. Perkins
Braids and trimmings, Machine for making, 2 pats....J. E. Kirberg
Brick-machine....G. M. Griswold
Broom....F. Becker
Broom-holder....G. E. Selsor
Brush....H. M. Schwartz
Brush-bridle, Adjustable....W. Reese
Brush holder, Tooth-....R. M. Ryan
Brush-making machine, 2 pats....H. M. Schwartz
Brushes, Manufacture of....J. J. Potter
Buffing machine....J. F. Gail
Building structure....C. C. Stutz
Buildings, Construction of....B. H. Marshall et al
Burglar-alarm....W. A. Helphenstine
Burglar-alarm....S. B. Perry
Burial-shirt....C. C. Holcomb
Cable-terminal....F. B. Cook
Cage, Breeder's....T. H. Knaak
Calculating-machine....A. J. Meier
Camping device, Canvas....A. G. Lukenbill
Can....J. G. Swain
Can ends, Runway for....J. F. Wing
Candlestick-lubricator....E. L. Faul
Candy-pail....C. A. Lee
Candy-pail cover....G. B. Griffin et al
Canning apparatus....L. L. Lawrence
Canopy....L. F. Buscnbark
Capsule-filler....P. H. Brown
Car and operating mechanism, Dump-....E. L. Stoltzfus et al
Car door, Combination side and grain-....H. Hedstrom
Car, Dump-....H. Pries
Car, Dumping....C. P. Astrom
Car-fender....R. C. Morganstern et al
Car fender, Street-....J. Allez
Car-rerailer....R. H. Smith
Car, Stock-....T. J. McKay
Carbid-feeding device....A. Davis
Carbureter....F. Svagell
Carbureter....A. Winton
Cards, Playing-....W. T. Eddins
Carpet and matting holder, Adjustable....G. E. Jackson
Cash-register....W. H. Muzzy
Casting-machine....F. N. Cline
Cement and like materials, Process of and apparatus for burning....B. E. Eldred
Cement-post attachment....E. M. Slayton
Cement, Process of and apparatus for burning....B. E. Eldred
Centrifugal device....F. Hampl
Centrifugal machine....G. N. Goddard
Chair-strap for holding babies....M. L. Carrington
Chuck for high-speed drills....J. O. Reynolds
Churn-power....W. S. Whitney
Cigar-lighter....C. S. Drake
Cigar, Self-igniting....J. H. Hoover
Circuit-breaker, Automatic....H. W. Cheney
Circuit-closer....O. M. Tustison
Clock, Chime-....P. H. Klein, Jr.
Clothes-frame, Revoluble....J. A. Turpin
Clutch....C. P. Hollister
Clutch, Friction-....H. A. Krueger
Clutch, Friction-....A. Lint
Coal-handling apparatus....G. W. Freeland
Coaster, Wheel-....L. R. Valentine
Cock, Gas-....C. W. Boyse
Cock seating-washer....J. H. Glauber
Coffee-roaster....N. T. Coley
Coin-controlled lock....H. B. Meade
Coke-oven....L. Bansart
Collar, Coat-....M. Koppleman
Collar-stay....H. A. Aldred
Collar-supporter....J. C. Doran
Collar-supporter....H. A. Aldred
Comb....J. C. McLean
Comb attachment....H. H. West
Commutator for electrical machines....F. R. Kunkel
Compass, Beam-....H. E. P. Taylor
Concentrating apparatus....C. A. La Point
Concrete-construction forms, Bond of....C. M. Markham
Concrete constructions, Means for reinforcing....J. T. Simpson
Concrete constructions, Reinforcing-bar for....J. M. Dudley
Concrete holding and carrying device....A. N. Doud
Concrete structures, Constructing sunken....W. H. Fahrney
Concrete tiling, Machine for making....R. Z. Snell
Conduit....W. Houghton
Conduit, Underground....S. B. Way et al
Conduits, Cable-operated carrier for....W. W. Alexander et al
Controller....H. Smith
Conveying apparatus....J. T. Cowley
Cooker....J. C. Prims
Cooking utensil....C. M. Hill et al
Cooking utensils, Heat-distributer for....A. B. Cruickshank
Cooler....V. F. Barbaro
Core....E. H. Proffitt
Coring machine, Cahbage-....C. B. Gedney
Corset, Apparel-....D. Kops
Cot and hammock, Combined....H. Menten
Cotton-press....B. Thoens
Coupling-head, Auxiliary....P. W. Hogan
Crane....P. H. Douglas
Crate, Folding....C. E. Clark
Crate, Folding poultry-....H. D. Dennis et al
Crate, Knockdown....J. B. Noyes
Crucible....P. W. Shimer
Crushing or pulverizing machine....C. A. Doen et al
Culinary device....L. Nelson
Cultivator....J. C. and H. O. Williams
Cultivator....E. W. Werden
Cultivator or plow, Wheeled....T. D. Heath
Cultivator, Riding-....A. E. Kistler
Culvert....G. Mahoney et al
Currents, Device for steadying....P. H. Thomas
Curtain-fastener....E. J. Lombard
Curtain-fixture....C. H. Forsyth
Cut-off, Float....H. Mohr, Sr.
Cut-off, Rain-water....E. E. Brott
Cutlery, Metal handle for....W. B. Hatfield
Cutter....F. A. Meier
Cycle....P. C. Jeppesen
Cycles, Detachable trailing carriage for....A. E. Abrahamson
Cyclometer for bicycles....A. Ruffin
Cylinder-ring....W. A. Wehrman et al
Dating-machine....B. B. Conrad
Desk, Folding writing-....C. Mohr
Die....W. H. Grissom
Disappearing table....G. H. Witthaus
Display-holder....B. Rosenberg
Display-rack....J. D. Walsh
Display-rack, Folding....R. E. McKay
Distant register....W. H. Muzzy
Door-securer....J. U. Tabor
Door stop or securer....R. Pitt
Draft device....H. J. Klasing
Drain-inlet....J. and D. D. Friedman
Draw-har carrier....C. H. Tomlinson
Drier....H. W. Shepard
Drill and socket....J. M. Goodwin
Drilling-machine tapping attachment....R. Milne
Drilling, Tool for holding disks for....F. H. Oakman et al
Drinking-fountain, Poultry....H. B. Anderson
Driving mechanism....E. P. Webster
Drum....A. D. Converse
Drum, Mixing-....J. W. Cumisky
Dye, Vat-....P. Thomaschewski
Electric-arc light....S. E. Donnelly
Electric heaters, Controlling means for....E. H. Richardson et al
Electric iron....D. W. McClay
Electric machine, Dynamo-....F. R. Kunkel
Electric machine, Dynamo-....H. M. Scheibe
Electric meter....D. C. Jackson
Electric outlet-box....C. J. Dorff
Electric-wire conduit....H. N. Speer
Electrical currents, Unidirecting....E. A. Burlingame
Electrical receptacle, Weatherproof....F. J. Russell
Electrical starting device....J. L. Schureman
Electromagnetic-wave signaling....R. A. Fessenden
Electromagnetically-operated apparatus....R. E. Hellmund
Electroresponsive device....E. A. Terpening
Elevator....J. T. Crowley
Elevator door, Sidewalk-....C. S. Hoffman
Embroidery-hoop....S. W. Gibbs
Engine....T. R. Thurber
Engine-cylinder lubricator....J. A. Daubenspeck
Engines, Drive-gearing for traction-....D. W. Keyes
Engines, Fuel for internal-combustion....G. B. Selden
Engines, Leveling mechanism for traction-....R. C. Gorham
Envelop....H. W. Stewart
Envelop....R. D. Townsend
Excavator-shovel, Tandem....C. C. Jacobs
Fabric....J. L. Patterson
Faucet....J. H. Glauber
Feeder, Automatic....G. L. Poh
Fence-tie-forming die....B. A. Garlinghouse
Fertilizer-distributer....W. J. Adams
Files, Division-plate for document-....W. J. Vick
Filter....F. B. Anderson
Fire-escape construction....W. O'Keefe
Fire-extinguishing apparatus with siphon arrangement....W. Böckem
Fish-line float....J. Garrard
Fish-stringing device....R. Coleman
Fly-wheel....G. Scaramuzza
Folding case....A. B. Sutzer et al
Forming-machine....H. C. O'Bleness
Fruit-cleaner, 2 pats....F. Stebler
Furnace....C. F. Diller
Furnace-oven, Removable....N. E. Storms
Furniture, &c., Manufacturing material for making articles of....H. B. Morris
Fuse-lighter....C. C. Myrick
Gage-head....J. W. Beard
Galvanizing....G. L. Patterson et al
Garment-rack....F. Wolf
Garment-supporter....G. Barfus
Gas, Apparatus for generating hot compressed....H. Neumann
Gas-burner valve....L. L. Carnahan
Gas-engine....H. M. Yeager
Gas extinguisher and lighter....J. A. Matonsek
Gas-furnace....J. Bueb
Gas, Generating producer-....H. F. Smith
Gas-heater....J. A. Eddy
Gas-lighting appliance....F. F. Dier
Gas-lighting appliance....F. F. Dier et al
Gas-producer grate and means for removing ashes therefrom....H. F. Smith
Gas suitable for illuminating and heating purposes and making said gas, Liquid....L. Wolf
Gas, Treatment of acetylene....J. H. James et al
Gate....A. V. Rowe
Gear, Variable-speed....H. E. Williams
Gear-wheel....N. D. Levin
Gearing, Changeable-speed....W. Scott
Gearing, Speed-....J. S. Barnes
Gearing, Variable-speed....W. A. Widmer
Gearing, Variable-speed....J. S. Barnes
Glass, Annealing and hardening....J. J. Farling
Glass in the heat, Apparatus for working....J. Kremenezky
Glass shade and screen....A. Steffin
Gradient instrument....R. Sobotka
Grain-separator....E. G. Clymans
Grate, Fireplace-....J. H. Dwight
Grip device, Intermittent-....H. W. Fellows
Gun, Machine-....A. F. Swahn
Gun, Oil-....T. B. Wilkinson
Gun with breech-action....F. Jaeger
Hand-bag....A. Schönberg
Harvester, Cotton-....A. W. Johnson
Hat, Man's....E. B. Hollenbeck
Hay rake and tedder, Combined....L. M. Jones
Heading-machine....W. D. Thomas
Heat-conserving receptacle....J. H. Wilson et al
Heater....J. J. Kelly
Heaters, Apparatus for automatically regulating....J. Naughton
Heating device for lacquering....W. W. Vincent
Hinge and brace, Adjustable....T. D. Meyer
Hinge, Extensible....W. F. Hunter
Hitching device, Horse-....R. Cardin
Hoe....W. S. Davis
Hoisting-machine....J. Bowles
Hoisting-machine....C. F. Dallman
Hoisting machinery, Clutch for winding-drums of....C. P. Turner
Holdback....C. Hastings
Hoof-nippers....J. A. Ryden
Hook and eye....S. A. Cinnamon
Horse-detacher....J. A. Borland et al
Horse-rake....K. Hoshino
Horseshoe....G. F. Fassett
Hose connection....H. Strom
Hose-coupling....J. P. Baird
Hosiery, Looping-machine for....F. and J. F. Nelson
Hot-air furnace....J. M. Keller
Household utensil....E. C. Price
Huh, Vehicle-....J. T. Watters
Hydrant....G. W. Johnston
Hydraulic governor....A. Dickerson
Hydrocarbon-burner....W. Scrimgeour, Jr.
Hydrocarbon-burner....W. Scrimgeour
Incandescent mantles, Producing....G. Buhlmann
Inhaler....V. E. Randall
Ink....R. W. Hochstetter
Ink....R. Hochstetter
Insulating-joint....C. A. Jaynes
Insulator for third rails....L. Steinberger
Internal-combustion engine....H. H. Simon
Internal-combustion engine....E. Berliner
Invalid's table....M. A. Hawley
Iron, Refining....P. Sejournet
Kinetoscope, Continuous-film....C. B. Gillespie
Knitting-machine....W. W. Burson
Lamp, Arc-....D. R. Knapp et al
Lamp, Gas-....C. W. Boyse
Lamps, Bunsen burner for incandescent gas-....M. Jacobs
Lantern-top....D. C. Kline
Last....W. E. Ellis
Last-cord fastener....P. H. and T. A. Hickman et al
Latch, Gate-....J. B. Walser
Lathe, Multiple-spindle automatic....E. U. Harrison
Lathes for boring elliptical openings, Attachment to....J. Shaw
Lathing, Manufacture of metal....W. Klocke
Lathing, Manufacturing metal....W. Klocke
Lavatory....H. Podmore
Lawn-sprinkler....A. Fisher
Leather-skiving machines, Marking or printing means for....R. P. Grant
Letter, Illuminated shaded....C. H. Hulse
Level and plumb, Combined....J. L. Greene
Leveling-har head....I. S. Hearn
Life-preserver....G. Krieger et al
Lighting-fixture, Preheating....W. N. Best, Sr.
Load-retaining device....E. A. Thompson
Lock....W. A. Hurst
Locks, Antifriction-bearing latch-bar for....J. B. Webb
Locker-hook....W. N. Vance
Locomotive-boiler....O. D. Orvis
Loom shuttle-motion....J. A. Gendron
Looms, Pattern mechanism of....O. L. Owen
Looms, Reed-actuating mechanism for....J. A. Gendron
Lotion....G. Pucciarelli
Low-water alarm....F. D. Goodnough
Lubricator....W. L. Newbaker
Lubricator....H. A. Swanson
Macaroni and the like, Machine for making....J. Rivara
Magnet, Lifting-....A. C. Eastwood
Magnet, Polarized....E. A. Burlingame
Mail-bag catching and delivering device....J. J. Cruse
Mail catching and transferring apparatus....F. Blankenberger
Main and pipe cleaner....H. A. Greenan et al
Mangle....C. H. Mattice
Manifolding-pad....E. K. Bottle
Match-box and cigar-cutter, Combined pocket....J. Havassy
Matter or objects in quantities, Examining....J. I. Solomon
Mattress....D. E. Miller
Measuring apparatus....R. Hoyt
Measuring device, Dress-....N. E. Jaeger
Meat-cutter....C. W. Kuhn
Meat-hanging device....J. E. Mowinckel
Meat products, Smoking and curing....M. Brand
Metal-coating apparatus....H. M. Huxley
Metal-shaping apparatus....W. W. Bissell
Meter system, Electrically-controlled....H. P. Clausen
Micrometer-gages, Spindle-lock for....L. S. Starrett
Mine, Buoyant mechanical submarine....T. Novero
Mold....J. F. Monnot
Mold....L. A. Brown
Mold for casting sash-weights....J. C. and G. L. George
Molding device....A. M. Thompson
Molding-machine....W. B. Bolles
Molding-machine....T. E. McNamara
Monkey-wrench, Ratchet....A. C. Jenrich
Mortising-machines, Pneumatic attachment for....E. E. Houghton
Motor....J. R. Morrison
Multiple-pendant switch....C. D. Gervin
Musical instrument, Pneumatic....T. P. Brown
Musical instruments, Automatic playing attachment for....P. Welin
Musical instruments, Harmonic attachment for stringed....L. E. Hull
Musical instruments, Pneumatic action for....P. Welin
Nailing-machine....G. B. Evans et al
Nut, Lock-....J. J. Fifield
Nut-lock....I. N. Anderson
Nut-lock....S. L. Smith
Nut-lock....E. G. Brightful
Nut-tapping machine....R. J. Rood
Nuts, Dies and punches for making....G. Dunham
Nuts, Making....G. Dunham
Oar-lock, Bow-facing-....H. Hinken
Oil-burner....C. D. Wright
Oil-ring retainer....F. P. McBerty
Oil, Separating water from....J. W. Pittock
Oiling device for pulleys or wheels, Self-....J. D. Oliphant
Ore-classifier....F. G. Janney
Package....R. W. Belson
Package-box, Collapsible....M. Orzali
Packing and making same....T. Murphy
Padlock....J. J. Murphy
Paint or color disperser with locking device for the valve-operating lever....H. Mikorey et al
Painting-machine....H. E. Ford et al
Paper-bag machine....J. Rogers
Paper-cutter....J. Dahly
Pattern for garments, Block-....E. H. Peterson
Pavement-cutter....D. E. Wiseman et al
Pawl-and-ratchet mechanism....W. Trewhella
Pen, Fountain-....L. H. Lloyd
Pencil attachment....M. E. Danahay
Pencil, Mechanical....E. Bergquist
Photographic-film packs, Adapter for....H. M. R. Glover
Photographic plate or film, Flexible....M. Hansen
Photographs, Method and means of making panoramic....E. N. White
Piano....F. C. Ott
Picture lanterns, Safety-shutter for moving-....W. N. Selig
Piling-clasp....L. E. Edmunds
Pipe-hanger....E. E. Taft
Pipe-joint....L. Billé
Pivotal connection....F. R. Kunkel
Planter attachment, Wireless check-row corn-....J. W. Trader, Jr.
Planter, Check-row corn-....R. Chamberlain
Planter, Corn-....L. E. Waterman
Plaque-cleaning machine....A. L. Bausman
Plow, Beet-....L. Brenneis
Plows, Sweep-stock attachment for....J. H. Hewitt
Plumb-bob....L. O. Sloggett
Plural-jet burner....C. M. Lungren
Pocket, Safety-....D. Traxler
Pole, Wagon-....W. H. Spillman et al
Polishing device, Electrical....T. H. Rodman
Power-transmitting mechanism, Coupling for oil-well....L. E. Shiray et al
Press....W. Klocke
Printing-machine....H. J. Smith et al
Printing machine, Yarn-....N. Costikyan
Printing-press....F. H. Van Loozen
Pulley....P. D. Skahen
Pulley....U. T. Gaba
Pulverizer and planter, Combined....J. E. Houghland
Pump, Centrifugal....H. A. Prindle
Pump, Deep-well....B. Dewoody
Puzzle....O. H. Rawitch
Puzzle....A. J. Zschokke
Quilting-frame....C. E. and L. A. Ashby
Rack....L. Hunt
Radiator attachment....E. J. Glackin
Rail connection....F. Metejka
Rail-fastener....J. E. Ogden
Rail-joint....F. Mihalik
Rail-splice....C. G. Gates
Rail-tying mechanism....W. F. Andrews
Rails, Automatic cleaning device for tramway-....J. Sandoz-Sutter
Railway block system, 3 pats....G. W. Nistle et al
Railway-crossing....J. W. Baldwin, Jr.
Railway-crossing gate....J. W. Noel
Railway, Elevated suspended-track automotor-....F. E. Felts
Railway-rail fastener....M. L. Byers
Railway selective apparatus....S. R. Wright et al
Railway selective signaling device....S. R. Wright
Railway-signal....W. J. Rader

Railway-sleeper, Reinforced-concrete, with special fixing device....B. Sani
Railway-switch....T. W. Cox
Railway-switch....B. Ruhbaum
Railway-switch, Automatic....I. A. Call
Railway-switch-locking system. G. W. Nistle et al
Railway-tie....J. Staats
Railway-tie....D. Stevens
Railway-tie....H. Cockell
Railway-tie....G. A. Starkweather
Railway-tie....G. Whitaker
Railway-tie and rail-fastener....H. O. Olson
Railway-tie, Concrete....J. B. Pope
Railway-tie, Metal, 2 pats....W. W. Mechling et al
Railway-tie plate....L. Dilworth
Range-finder....W. H. M. Christie
Ratchet-wrench....F. E. Walden
Razor-blade-stropping device....O. Kampfe
Razors, device for stropping double-edged safety-....F. Mitchell
Receptacle, Adjustable attachment....L. P. Benson
Refrigerating apparatus....J. Schneible
Refrigerator-cars, Floor construction for....J. Strain
Relay, Electrical....E. E. Clement
Relay, Frequency-....D. J. McCarthy
Resistance-cup....F. Gottschalk
Rheostat....C. R. Meston et al
Ring-travelers, Holding and delivering means for....L. S. Burbank
Riveting-machine....J. A. Mosher
Rock-cutting apparatus....F. W. Allan
Rolling-mill....H. Keitel
Roofing-nail....J. Conway
Rotary engine....L. L. Driggs
Rotary motor....M. Naëder
Rubber spading-boot..S. V. Van Denburgh et al
Rudder, Jury-....W. Manwaring
Safety device....W. Cooper
Safety stop-signal, Automatic...W. E. Adams
Sash-balance, Adjustable....E. M. Erb
Sash-lock....A. A. Solaway
Sash-lock....R. Taube
Sash operating and locking mechanism....R. H. Jones
Sash support, Window-....N. H. Conger
Screen....N. Ellwart
Screw-thread-cutting mechanism....W. G. Allen et al
Scythe-snathe....J. N. Radcliff
Seal and lock, Window or door..C. E. Lahart
Sealing device, Bottle-....R. V. Lyon
Sewing-machine ruffler....W. R. Parsons
Sewing-machine tuck-creaser....F. W. Beckert
Sewing-tool....C. E. Betts
Shade and curtain-pole bracket, Adjustable....A. L. and C. L. Rezenbrink
Shade-bracket....H. Wittmann
Shade-bracket and curtain-pole support, Combined....R. B. Jefferey
Shade fixture, Window-, 2 pats....D. Hoyt
Shampoo-tray....C. B. Lovett
Sharpener, File-....J. C. Rink
Sharpening machine, Saw-....G. H. Robinson
Sheet-feeding device....F. B. Davidson
Sheet-metal structures, Uniting the component parts of composite....A. F. Rietzel
Sheet-metal wheel, Sectional....J. F. Craven
Shingles from paper-pulp, Apparatus for making....J. T. Collins
Shoe-polishing machine....E. F. Stratton
Shoe-rack....W. F. Atwood
Shovel....A. Schultze
Shuttle-operating device....G. Schwabe
Sign-board structure....M. P. O'Brien
Sign, Illuminated-letter....C. H. Hulse
Signal....J. M. Kennedy et al
Silicon nitrid, Manufacturing....A. Sinding-Larsen
Single-phase commutator-motor...V. A. Fynn
Sink, washtub, and similar article....F. H. Caldwell
Skate....J. E. Martin
Skirt-gage....J. D. Ball
Skiving-machine attachment..G. A. Henderson
Smoke-producing device....H. and R. Pinegar
Snow-plow for sidewalks and highways....W. W. Cowan
Sound-producing instrument....F. Gottschalk
Sound-producing machine....J. Wellner
Sparker....G. A. Weidely
Speaking-tube....W. F. Simpson
Speed-changing mechanism....W. O. Foss
Speed-controlling mechanism....A. M. Wolf
Speed-indicator....H. Dahl et al
Speed mechanism, Variable-....A. G. Mather
Spinning or twisting machine....W. P. Wood
Square and bevel, Combined...E. A. Williams
Stamps to letters, Device for affixing postage-....A. Tebbit
Stave-formed structures, Machine for tying bands in....D. E. Vanvactor
Stave-punching machine....D. E. Vanvactor
Steel, Toughening....S. S. Walcs
Stove attachment, Gas-....H. Knudsen
Stove, Heating-....E. R. Cahoone
Straightening-machine....E. A. Lane
Strainer, Sink-....A. W. Andrews
Stud or button....E. L. Anderson
Suit-case handle-connection device....G. W. Wood
Surface indicator....F. Brink
Suspenders....J. Weis
Sweeping-machine....J. O. Johnson
Swing-gate....G. I. Kendrick et al
Tanks or cans, Safety attachment for....N. B. Ippolito
Tapper, Beer-....R. B. Spikes
Tare-weight....J. W. Ford
Telegraph and telephone wires, Guard for....C. J. Elliott
Telegraph-pole....W. H. and H. R. Smalley
Telegraph-sounder intensifier....R. W. Crawford, Jr. et al
Telephone system....D. W. May
Telephones, Sanitary guard for..S. E. Florsheim
Telephonic apparatus....E. A. Graham
Telescope-mounting....F. L. Smith
Tent, Folding....H. G. Hergelroth
Tent pin or anchor....J. F. Miles
Textile fabric....J. G. Elliott
Thread, Spool of....J. J. Drury
Tie-plate....I. H. King
Tile, 2 pats....H. C. Moore
Tile and sewer outlet protector, Drain-....O. A. and J. A. Tenold
Tire armor, Pneumatic-....C. E. Evans
Tins or canisters for preserves, Apparatus for flanging....A. Wilzin
Tire, Non-skid....E. Kempshall
Tire-setter....H. M. Lourie et al
Tire signal, Pneumatic-....S. Silverman et al
Tire, Vehicle-....W. A. Köneman
Tire, Vehicle-....M. Behrer
Tire, Pneumatic....R. J. Ruths
Tires, Gaiter or patch for repairing pneumatic....H. Marles
Tires, &c., Hose connection for wheel-....E. J. Rohrbacher
Tires, Valve for pneumatic....G. De Vigne
Toilet-case....E. B. Pike
Tongs....A. G. Carlson
Top....S. Gropper et al
Towing-post....W. F. Johnstone
Toy....O. S. Meyer
Toy, Figure....W. H. Fisher
Traction-wheel....N. Campbell
Train-stop, Time-limit....W. Brewer
Trains, Means for controlling the operation of....J. F. and J. F. Webb, Jr.
Trap....J. C. Wood
Trap....D. Morgan
Trolley....F. Kompe
Trolley-base....C. E. Gierding
Trolley-pole-controlling means..C. E. Cozzens
Trolley-pole for electric-railway cars. T. Oliver
Trolley switch-plate....E. Bell
Trunk....J. Finzler
Trunk-lock, 2 pats....H. W. Cottrell
Tube-cleaner....W. S. Elliott
Tubes, bottles, &c., Closure for collapsible....E. B. Pike et al
Tumbling apparatus....P. C. Patterson et al
Turn-table....M. J. Leonard
Type-writer, Telegraphic....E. Burlingame
Type-writing machine....C. Delvigne
Type-writing machine....A. T. Brown
Type-writing machine....J. C. Doane
Type-writing machine....H. S. McCormack
Type-writing machine....J. C. McLaughlin
Type-writing machine....E. L. Pfunder
Umbrella, Folding....J. Charlesworth
Umbrella-window....G. R. Livergood
Valve....C. G. Harcourt
Valve....J. Stevison
Valve....D. F. Morgan
Valve, Automatic intermittent flushing-....H. A. Kieselhorst
Valve, Gas-....J. Melnik
Valve-operating mechanism for internal-combustion engines....S. Löffler
Valve-operating mechanism, Furnace-....J. W. Seaver
Valve, Regulating-....H. C. Benwitz
Valves, Disengaging device for motor-driven..T. H. Ward et al
Vault, Burial-....S. E. Burke
Vaults, Mold for concrete burial-....M. J. Demorest
Vehicle....B. Tippmann
Vehicle cushion-wheel....F. Groff
Vehicle-spring....E. Bollbach et al
Vehicle-top, Foldable....W. S. Butler
Vehicles of any kind, Antivibration device for....G. Huysmans
Vehicles, Stalk-cutting attachment for....R. B. Human
Velocipedes, Pumping device for..P. G. Larsson
Vessel-lid holder....R. M. Dixon
Vessels, Apparatus for elevating submerged..G. Pino
Vinegar, Making....W. Antoni
Wagon-box, Drop....A. T. Cyr
Wagon, Dumping-....G. M. Head
Wagon-jack....A. A. Roon
Washing-machine rake....A. C. Sargent
Water-closet-fastening device....J. F. Kelly
Water-cooler....W. G. Eads
Water-distributer....W. C. Johnson
Water-gage....C. Carlson
Water-heater....F. A. Knapp
Water-heater, 2 pats....H. S. Humphrey
Water-heater....J. W. Ellebrecht
Water-heater, Automatic....R. Hoffman
Wedge, Ax and tool handle....G. P. Morrill
Weighing-machine....K. Böttcher
Wheel attachment, Furrow....L. J. Hamilton
Wheel lock, Hand-....T. H. Ward et al
Whetstone, blotter, and ruler, Combined....E. B. Pike
Whip-socket....J. C. Feickert
Windlass....C. H. Richardson
Window and door screen....A. C. Davis
Window, Flexible....W. E. Walsh
Window-pane fastener....A. E. Cherry
Window-screen....W. A. Loper
Wire-rope clamp....C. C. De Witt
Work-clamp....H. Howell
Wrench....A. Frick
Wrenches, Pipe-gripping attachment for monkey-....F. Gorman
Yarn....W. P. Wood

DESIGNS.

Automobile-horn....E. Rubes
Brooch....R. C. Thompson
Brush, Shaving-....C. E. Thompson
Clock-case....D. I. Hurley
Coffee-pot....W. C. Codman
Curtain-edging....C. Weinberg
Dish....W. H. Tams
Lamp body, Inverted incandescent gas-....F. C. Adams
Lamp cluster, Incandescent electric-....I. Libson
Lighting-fixtures, Plaque for....G. H. Ullman
Massaging-implement case....A. H. Apfel
Mirror....C. L. Cruver
Muff....T. H. Northrup
Reflector or similar article....O. A. Mygatt
Rug....H. C. White
Scale-frame....L. Jaenicher
Show-case....W. M. McLean
Tea ball....H. A. Weihman
Toy....W. S. Miners

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Adding machine....W. J. Kilpatrick
Adding-machine carriage mechanism....J. G. Vincent
Aeroplane....O. Heeren
Agricultural implements, Draft appliance for....A. Hartman
Agricultural shovel....J. N. Parker
Air, Apparatus for regenerating vitiated....G. F. Jaubert
Air-cooling apparatus....J. E. Gloekler
Air-coupling, Automatic....A. E. Squyars
Air-separator....G. S. Emerick
Air-ship....C. J. Berthel
Air-ships, Paddle-wheel particularly for use on....F. Fronz
Albuminate preparation, Soluble-iron-....E. Laves
Aluminous materials, Treating..A. C. Higgins
Aluminum ores, Treating....F. J. Tone
Aluminum silicate ores, Treating...F. J. Tone
Amalgamator....E. Hackett
Amusement apparatus....T. Hellicsen
Animal-trap....O. Lund
Animal-trap....S. Rich
Arm-rest and window-guard, Combined....J. Huberlin
Asymmetric cell....W. C. Arsem
Automobile-buffer....A. L. McGregor
Automobile-propelled vessel....J. W. Freeman
Automobile safety steering attachment....H. P. Larouette
Axle box and washer....M. E. Boddy
Axle-lubricator and dust-excluder. H. P. Hansen
Bag-frame....C. Hicring et al
Baggage-carrier....J. F. Heckert
Ball for use in athletics....R. Reach
Banjo....D. L. Day
Barge....H. W. Kirchner
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Battery-supporting mechanism. T. V. Buckwalter
Bearing, Adjustable flexible. M. A. Ganiard et al
Bearing, Antifriction-....H. Froböse
Bearing, Antifriction-....F. Henzelmann
Bearing, Ball-....F. Henzelmann
Bed, Folding....F. J. Crouch
Bed, Wall-....W. C. James
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Belt-fastener, Metallic....C. E. Coe
Berry-box....P. Henrich
Bicycle motor attachment....G. Belz
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Binder for loose-leaf books....C. B. Chapman
Binder, Loose-leaf....S. H. Mitchell
Binder, Loose-leaf....C. M. Cott
Binder, Stack and rick....T. V. Rutter
Biscuit-cutter....C. H. Hawbolt
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Boiler low-water alarm, Steam-....C. Brent
Bolster, Separable cast....J. M. Ames
Bolt and nut-lock....B. C. James
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Bottles or jars, Dipping device for....B. W. McGinnis
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Box....W. L. Howland
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Buckle....C. B. Davenport
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Burner for blast-flames....W. H. Schulte
Bust-suporter....A. Drake
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Cabinet, Swinging counter-....E. E. Constable
Cable-threading head....F. S. Woodward
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Can funnel attachment, Milk-...G. H. Marting
Candy-wrapping machine....M. E., W. W., H. L., and A. F. Buhse
Canteen....R. O. Stebbins
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Car-brake....H. Hoffman
Car-door....C. W. Leaning
Car-door gear....H. Allen
Car, Dump-....W. O. Olden
Car-fender....N. F. Alston
Car-fender....Y. M. Créchrion
Car fender, Street-....H. D. Gardy
Car, Passenger-....P. M. Kling
Car, Passenger-....F. Koch
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Car-roof, Metal....J. J. Hoffman
Car-step, Folding....J. Nesbitt
Car-underframe....J. M. Ames
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Car underframe, Tank-....J. M. Ames
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Car-wheel....I. P. Todd
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Cement-making apparatus..R. W. Lesley et al
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Cheese-hoop....C. S. Brown et al
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Churn....V. S. Klick
Clipper, Hair-....J. A. Campanello et al
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Clock, Alarm-....E. E. Stockton
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Clothes-pin receptacle....B. Hill
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Coin-chute....G. W. Peter
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Drill, Combination machine-....C. J. Coulter
Drinking-fountain..W. H. Densmore, Jr. et al
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Electric-current rectifier....E. Garretson
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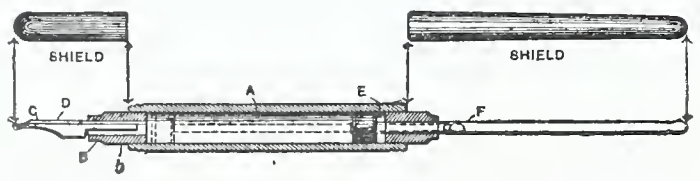
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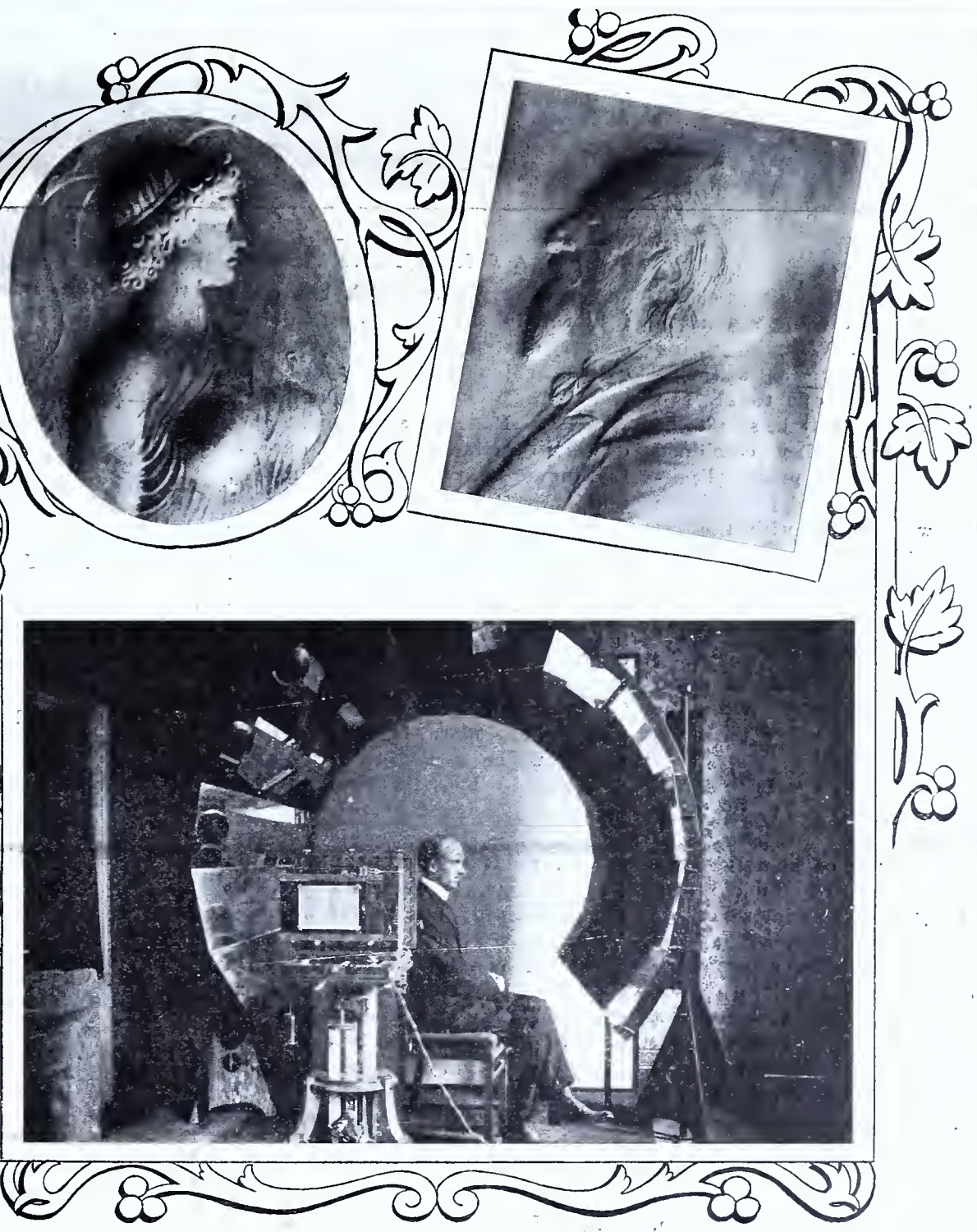
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PHOTOSCULPTURE.

By C. VAN LANGENDONCK.

UP to the present photography has been used both as a rival and as an aid to the artist in reproducing life on a flat surface, but a recent development indicates that it will soon invade the field of plastic art. Endeavors to extend the scope of photography to a third dimension date from the earliest days of the invention; but the results obtained have been negative. The chief element which enters in the present solution of the problem consists in the discovery, made years ago, that a certain gelatine rendered sensitive to light by the addition of bichromate, when immersed in water, will lose its responsiveness in a measure corresponding to the intensity of its illumination. This phenomenon would seem at first sight to solve the problem, as the substance in question produces, of its own accord, a relief whose depth depends exclusively on light intensity. In fact, a negative plate allows all grades of light intensity to be produced, so that a relief of any desired depth can be obtained. However, such a plate, in order to achieve this result, should be more or less transparent, according as corresponding portions of the model are more or less in relief, and ordinary photographic negatives do not comply with this condition. There are in fact two disturbing factors. For one thing, color is bound to exert some influence on the photographic record, so that surfaces in the same plane will come out with different intensities according to their tint. On the other hand, the light effects of an ordinary photograph depend chiefly on the angle of incidence upon the different parts of the model. The same beam of light which illumines an area of say one square inch, when striking a surface squarely, lights up a far greater surface when arriving at an angle, and as the same amount of light is used for illuminating surfaces of different sizes, the intensity of the illumination must vary according to the size (and hence the inclination) of the surface. The invention here described, which is due to an Italian engineer, Mr. C. Baese,



consists in a method of overcoming these difficulties, which seemed insurmountable. He inserted in a stereopticon a colored glass prism or wedge, the thicker portions of which absorb a greater amount of light, and the thinner portions allow more light to pass. This graduated illumination is made to strike the model to be reproduced in the shape of a plastic photograph.

If the model be photographed with illumination, owing to the two disturbing factors just mentioned (that is, the color and inclination of the surfaces) the graduations produced by the wedge will be practically lost. If, however, another negative be taken after inverting the glass prism and accordingly the direction of this graduation, those portions which formerly had been struck by the strongest light will now be in a half-shadow, while the remaining portions will be more intensely illuminated. However, this second negative will for the same reasons fail to show graduation of the prism. Now it will be noticed that the two negatives, while comprising the light graduations in opposed directions, are affected by the two disturbing factors in precisely the same way. It is well known that a photographic print will be dark where the corresponding points of the negative plate are bright or transparent. These facts are utilized by Mr. Baese in making from one of the two negatives a positive glass print, which is the reverse of the original negative, both as regards light graduations due to the glass wedge and as to the disturbing factors just referred to. The negative and positive plates are then placed one above the other so as to register accurately. When inspecting this combined picture as a transparency, the defects due to the two disturbing factors will be seen to be compensated for. The combined picture (which for all practical purposes may be regarded as a single picture) now complies with the requirement that its transparency should vary directly with the relief of the model and independently of the color and inclination of its surfaces. It can accordingly be utilized for obtaining photographic bas-reliefs on a bichromate gelatine plate. When the gelatine is exposed below the combined plate, the relief forms very rapidly. As soon as a sufficient relief is obtained, the process is discontinued and the model can be used for manifolding by any of the well known mechanical or electro-chemical processes. Instead of exposing the whole model at the same time, it may be illuminated in sections, reproducing each to a given depth of relief, viz. about one half inch. A convenient combination of the reliefs corresponding to the various portions of a model allows greatly increased effects to be obtained.

The principle of his invention once found, Mr. Baese improved his original experimental arrangements. Instead of using a colored glass prism, the light graduation is now obtained more efficiently by the aid of a rotating disk, in which is cut an aperture bordered by a peculiar curve for intercepting the light required for the desired graduation, the opposite graduation being secured through a similar disk showing an inverted curve. Then, instead of directly striking the model, the light generated by a single electric arc lamp is reflected on the latter by a system of mirrors arranged in a circle. The model is situated in the center of this circle, (as shown on front page) and is lighted with an intensity about thirteen times that of a single lamp. As this intensity always remains the same, and as the plates always have the same sensitiveness, a standard exposure of about five seconds can be made, thus eliminating any chances of failure as in ordinary photographic work.

As regards the possible applications of this method of "photosculpture," as it is rightly called, it should be understood that it is not intended to become a competitor but rather an aid to the real artist, like ordinary photography, which has become so indispensable to both the painter and sculptor. It may further be used for reproducing the original work of the artist with practically perfect truth and on any desired scale. On the other hand, photo-sculpture will allow plastic portraits to be obtained in all their details (as shown on front page.) Many art industries, such as those producing objects in gold and silver, medals, brooches, and articles of leather, paper, porcelain, etc., will likewise derive great benefit from this ingenious process.

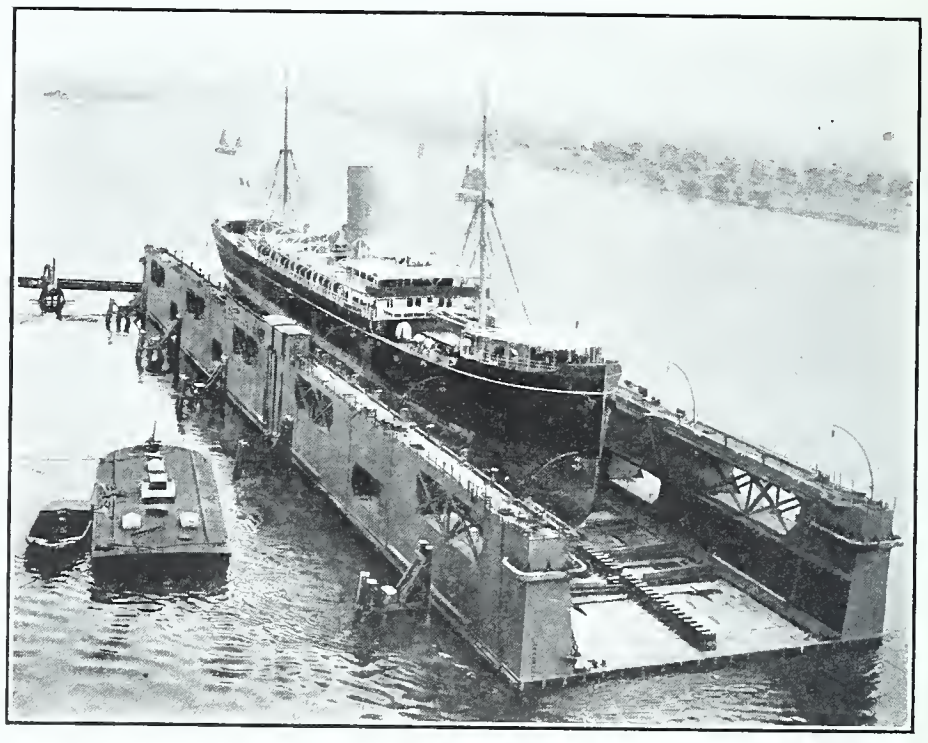
A Safe Explosive.

A new explosive which has come into use in the western part of the country during the past year or two is called Trojan powder. It has been tested in climates ranging from Alaska to Panama, and in branches of work that include mining, quarrying, tunneling, railway construction, and irrigating. This new powder departs radically in composition, according to the *Engineering Digest*, from other well-known high explosives, in not containing nitroglycerine, picric acid, gun cotton, chlorate of potash or saltpeter, although it is put up like dynamite and is exploded with the usual detonating cap or exploder. It is said to be stable, to be incapable of freezing, and not to lose its strength when stored for an indefinite time. It may also be transported and handled with safety, as it does not explode upon impact or jar. It gives off no noxious fumes, allowing men to return almost immediately after a blast in a close tunnel. It is slow and penetrating in its action, breaking the rock to a size that does away with re-shooting. The makers also assert that it is unaffected by the heat of the sun, having no ingredient to ooze through the shells, thus becoming a menace to the operator. Stick for stick, it is about 20 per cent lighter in weight than ordinary dynamite, and its action is spread over a much larger area.

The United States Government is using this explosive in the great irrigation projects of the Southwest, and it is also employed in many of the railroads now being built throughout the Western States.

ELECTRICAL FLOATING DOCK NEAR ANTWERP.

One of the most up-to-date of steel floating docks is located at Hoboken near Antwerp. It has 11,500 tons capacity, and is operated entirely by electricity. Since it represents the most modern developments in this direction, a brief description is given below.



The dock has seven centrifugal pumps directly coupled to electric motors, and these high speed pumps are so powerful that they can raise the loaded dock in 90 minutes. It has a total weight of 4300 tons and is constructed in two sections, one having four, and one three pontoons, carrying the two side walls which measure 30 feet in height. The total lifting capacity is 23 million pounds.

One of the sections is 277 feet 9 inches long and the other is 207 feet 8 inches long, and the height of the pontoons is 12 feet 10 inches, while the total width of this enormous floating dock is nearly 100 feet. It is owned by the Compagnie des Cales d' Anvers, and is equipped with a most complete electric installation, arc lamps as well as incandescent being utilized, with numerous motors for operating electric machine tools, hoisting apparatus and other labor-saving devices. From the accompanying illustration a good idea may be obtained of the method of electric illumination with high power arc lamps on arched poles mounted on the side walls. This view shows a large steamer undergoing repairs.

A Giant Clock.

The largest series of clock chimes in America, and one of the largest in the world, constitute a feature of the Metropolitan Building recently erected in New York. Great difficulty was experienced in lifting the huge bells to their perch in the fifty-story tower. When the size—varying from 1500 to 7000 pounds—and their shape are taken into consideration, and the fact that they had to be placed on the edge of a balcony 650 feet above the sidewalk, it can easily be seen that the workmen had their hands full. The bells are supported on a pedestal of wrought iron about 10 inches in diameter and 4 feet high. Rising out of the top of this pedestal is a brass bolt, which passes through a hole in the back of the bell. The bells were raised by derricks and dropped over the bolt in the top of the pedestal, a large brass nut holding them in place.

In striking the bells five large hammers of wrought iron are used, controlled by a huge electric self-winding clock on the 26th floor, which in turn is regulated by a clock in the basement. The bells are beautiful products of the bell-maker's art, and are probably the most expensive of any made in modern times. They are composed of 78 per cent pure lake copper and 22 per cent block tin, which combination experiment has shown to produce the sweetest and most musical tone. The largest one is nearly 6 feet in diameter at its mouth. The distance at which the chimes can be heard will vary according to atmospheric conditions; but on a clear day it is promised that the sound will carry for ten miles. The clock dial is almost 27 feet in diameter, with numbers three and a half feet high, and the two hands 9 and 12 feet long respectively. At night, electric light makes the numbers stand out in vivid contrast to the surrounding darkness.

Searchlights in Shells.

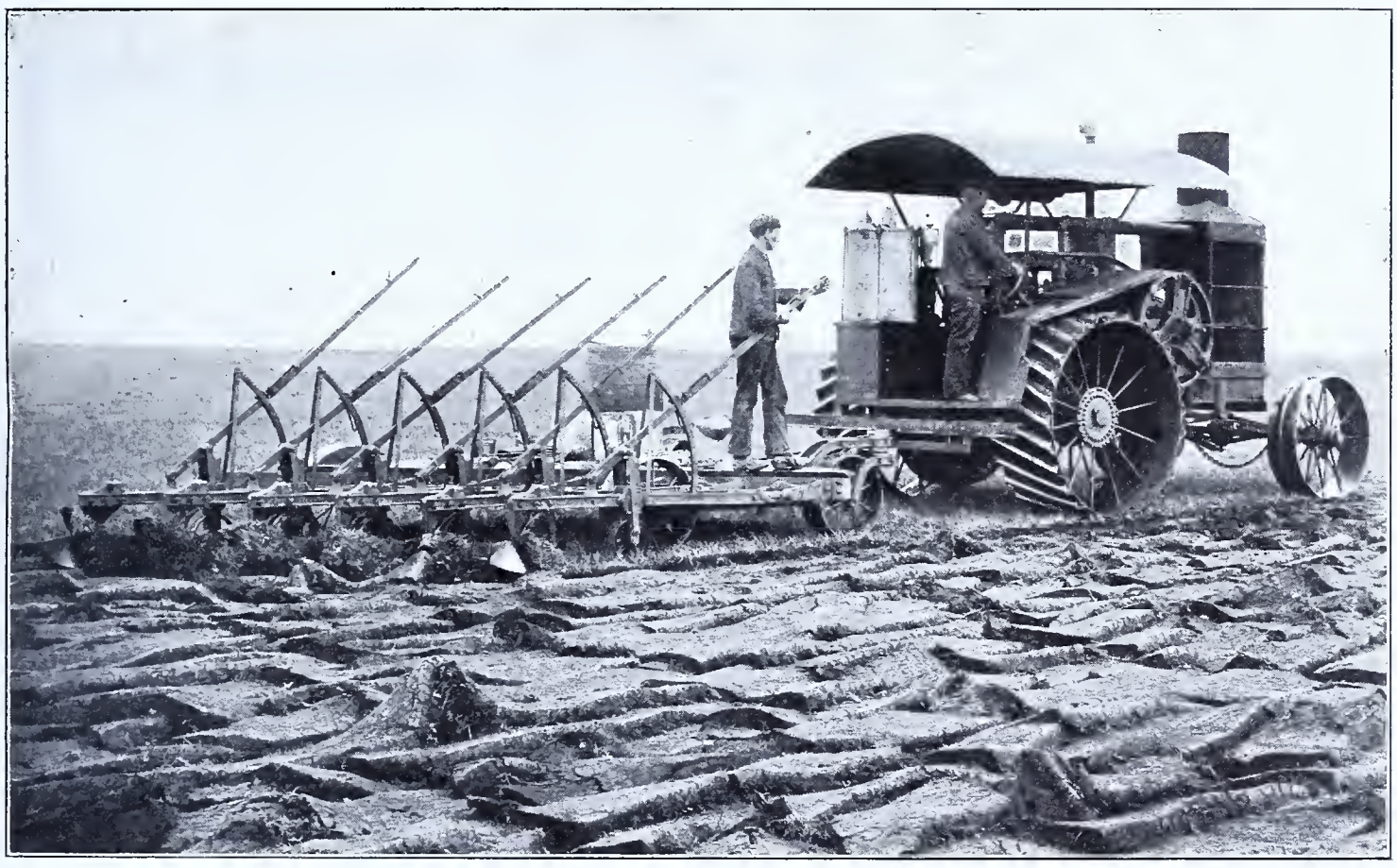
The electric searchlight used on ships may be replaced which are shot to some desired point, and there serve to illuminate the surroundings. The shells contain calcium carbide, and are fired by guns constructed for this particular purpose. The shell is so made that the water penetrates to the contents through a tube, and as is well know, the action of water on calcium carbide produces acetylene gas. Each shell will burn for several hours, and produces a light equal to 3,000 candle power. The obstacle to the employment of the searchlight is that it exposes the warship on which it is placed, and thus although it enables the vessel to detect other boats that may be approaching in the darkness, to use it is to invite attack. The advantage of the shell is that it permits the ship from which it is discharged to remain in obscurity, while throwing other objects into bold relief.

BREAKING PRAIRIE SOD BY MOTOR POWER.

By Frank C. Perkins.

The remarkable development of the gasoline and kerosene motor during the past few years has resulted in its use on American farms for pumping water, sawing wood, and other purposes to which a stationary motor can be adapted. This modern labor-saving device has been successfully applied to traction service on the farm, and has taken the place of both men and animals.

The kerosene traction engine for plowing marks one of the latest steps in the evolution of agriculture. Tractors are now extensively employed, not only for the relatively familiar operations of double disking, seeding, and cutting grain, but for breaking the land as well.



The accompanying illustration shows a 22-horsepower kerosene traction motor breaking prairie sod near Moose Jaw, Canada. Experience has shown that the ordinary steam threshing engines, built primarily for belt service, are subject to numerous expensive breakages; consequently, the traction engine has been made more substantial. Steel or semi-steel gearing has been substituted for cast-iron, with the result that the steam plowing engine of today is much more massive in construction than the threshing engine. This is made necessary by the severe service;—in fact no engine can be successfully used for this purpose unless especially designed for it. In other words, no ordinary threshing engine can be a successful plowing engine. On the other hand, the plowing engine is most successful as a threshing engine.

But though the steam plowing engine has achieved success, it is hampered by many inherent difficulties. In the first place, it requires a considerable force of men and horses to keep it in operation and to supply it with fuel and water. It so happens that where traction plowing is most desirable, fuel is high priced, and water is often unfit for boiler uses, and moreover, has to be brought considerable distances. It is not uncommon to find steam plowing outfits at work where three four-horse teams are required to keep them supplied with fuel and water.

The engines stand idle at least twenty per cent of the time, taking on coal and water. The weight is another drawback. It is not uncommon to find engines whose working weights are 36,000 to 40,000 pounds. There are large areas of territory where such weights cannot be transported over fields without driving wheels of excessive width, which make it difficult for the engines to turn and maneuver. A gasoline traction engine of rugged and substantial construction is free from the defects mentioned.

As the engine shown in the illustration is only rated at 22 actual traction horse power, it is not as large as many steam plowing engines. Still it is large enough for most farmers. Compared with steam plows of the same rating, it is more substantially constructed, and yet weighs only 19,000 pounds. It uses cheap kerosene or gasoline for fuel, the supply tank holding enough to last for a day's run.

A traction engine uses up much of its power in merely moving itself over the ground. If the ground is soft and the cleats sink in deeply, it may use more than half its power for this purpose. The gasoline engine described is capable of continuously developing 40 horse-power, and on firm, level footing it will use up about 18-horepower in propulsion, leaving the available tractive effort of the engine at about 22-horsepower. If the footing is quite soft, the available tractive power may be cut down to 18-horsepower. On the whole, the engine's tractive force is equal to that which can be continuously rendered by eighteen ordinary horses on a comparatively level ground.

There are two kinds of engine gang plows in common use—the moldboard and the disk. Each has some advantages not possessed by the other. In tough sod the moldboard is the only one that can be used for breaking. In sticky or "gumbo" soil the disk plow is best for stubble work. In dry, hard soils, such as are found in most of the semi-arid regions, the disk is equally suitable for breaking or stubble plowing. It is generally admitted that in any soil suitable for a disk plow, a wider furrow can be cut by this plow with the same effort than by a moldboard plow. In such soils, therefore, an engine with disks can turn more acres per day than with moldboards. If each disk cuts a furrow only 8 or 10 inches wide and 5 or 6 inches deep, the ground will be plowed equally as well. On ground where there are hidden stones, the disk plow is the safest one to put behind an engine. The condition of the soil and the depth of plowing also materially affect the draft of plows. It takes about one-third more power to pull a plow through heavy soil that is almost dry, than if it were thoroughly moist. On heavy soils the draft increases out of all proportion to the depth of plowing.

It is said that under average conditions, six 14-inch moldboard plows make a suitable load. Where disk plows are used, from eight to fourteen disks may be successfully operated, according to local conditions.

As to the extent of ground that can be covered per day with a gasoline engine, the following calculation has been made: In one mile there are 5,280 feet. A 14-inch plow bottom, in cutting one mile, will turn 6,160 square feet. At a speed of two miles per hour the area turned by one 14-inch plow will be 12,320 square feet. As there are 43,560 square feet in one acre, one plow (cutting 14 inches) in one hour will turn 0.283 of an acre, or in a day of ten hours, 2.83 acres. On this theory, four plows of the width mentioned in ten hours will plow about 12 acres; six plows 17 acres; eight plows 23 acres. It is a fact, however, that the ordinary day of the farmer is much longer than ten hours. Assuming that it is twelve hours, about twenty per cent should be added to the above figures.

It is stated that the kerosene engine is speeded to run 2 1-3 miles per hour on hard ground. On soft ground there is some slippage of the traction wheels, and a little time is lost in turning at the ends of lands. This, together with stops for oiling, make travel at the rate of about two miles per hour, or 20 miles per day of ten hours.

To demonstrate clearly the superior economy of the gasoline plowing engine, an estimate of the daily operating expenses of the two types of plowing outfits has been prepared, both of the same size, and each presumably capable of plowing the same number of acres daily. The prices are based upon average North Dakota conditions, and 40 gallons, the maximum consumption of fuel for ten hours, has been used as a basis.

The results are as follows for the steam plow:—

One ton Hocking Valley coal	$7.50
Licensed engineer, who also steers	5.00
Fireman, who also handles plows	2.00
Water and coal hauling, two men two teams	8.00
Board of four men at 50 cents per day	2.00
Board of four horses at 25 cents per day	1.00
Lubricating oil	.50
Total daily expenses	$26.00

The results for the kerosene or gasoline plowing outfit are:

Forty gallons kerosene at 13 cents	$5.20
Engineer, who also steers	4.00
Plowman	2.00
Board of two men at 50 cents per day	1.00
Lubricating oil	.50
Total daily expenses	$12.70

The saving in favor of the internal combustion engine over the steam traction engine it is thus seen is $13.30 per day.

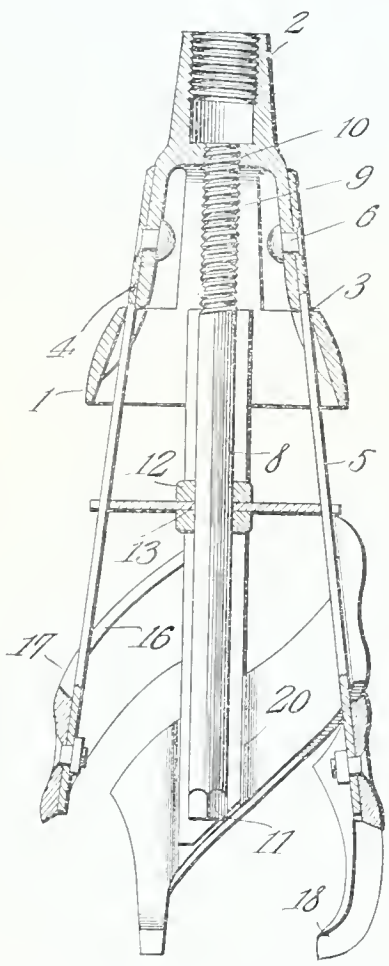
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CLEVER NEW PATENTS.

Flue Cleaner.—Coupling.—Locking Bolt.

Flue Cleaner.

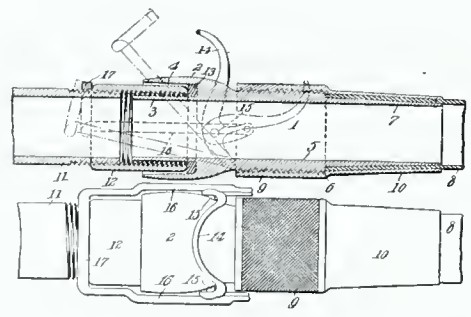
A device which will prevent the accumulation of objectionable matter in flues will find ready application in many industries. A cleaner for water tubes or smoke flues, recently patented by Harry A. Ruggles, of Reno, Kan., can be adjusted by simple means for operation on tubes of different sizes. The cleaning blades may be shifted inwardly or outwardly relative to the longitudinal axis of the cleaner, and means are provided for readily inserting them into, and withdrawing them from, flues without danger to the blades. Another novel feature is that the operation renders the cleaner self-sharpening. The hollow bell-shaped head (numbered 1 in the accompanying drawing) has a tubular interiorly screw-threaded extension 2 at its small end, there being a series of slots 3 formed within the head and extending therearound, each slot registering



with a longitudinal recess 4 formed in the head. Extending through each slot, and with one end in the recess, is a straight spring 5, passing through the large flared end of the body, the portion within the recess 4 being held in place by rivets. Longitudinal slots between the recesses of the head constitute outlets for the incrustations loosened by the tool. A spindle 8, arranged longitudinally within the head, has a screw-threaded end 9, engaging threads within the opening 10 formed between the head 1 and the tubular extension 2. The other end of the spindle has a head 11, designed to be engaged by a suitable actuating tool, and arranged on the spindle are collars 12, between which is mounted a spider 13. The arms of the latter radiate from the center toward the spring strips 5 and constitute bearings for the strips. Retaining lugs are formed on each arm and embrace opposite edges of the spring strips and hold them against radial movement relative to the spindle 8. The lugs hold the strips loosely, so that the spider can be moved along the strips by screwing the spindle into or out of the opening 10. Secured to the free end of each strip is a scraping blade, curved so as to conform to the interior contour of the flue. The blade also has its outer face concaved transversely and provided with edges extending throughout the limit of the blade, the rear face of the latter being beveled as shown at 16, so that the cutting edges are spaced from the spring strips 5. One of the blades is mounted on each spring strip and all of the blades are spirally arranged with their ends lapping, there being a forwardly extending bowed arm or runner 18 at the front end of each blade, while another arm is formed at that end of each blade nearest the head 1. The arm 18 of each blade is disposed in practically the same longitudinal plane as the arm 19, and the next adjoining blade lapped thereby. Each of the knives is provided in its inner face with a transverse recess 20, in which the spring strip 5 is seated, and a screw holds them together. The walls of the recess prevent the blade from rocking upon the screw. When the blades are thus assembled upon the strips 5, the rear arms 19 extend longitudinally of the strips, while the runners 18 project beyond the ends of the strips and turn inwardly. In use, the cleaner is placed in engagement with an actuating rod by screwing the extension 2 onto the rod. The spindle 8 is then rotated by a suitable tool engaging the head 11 so as to shift the spider 13 either toward or away from the head 1, this movement causing the spring strips 5 to swing toward or away from the spindle 8. After the desired adjustment has been attained, the tool is forced into the flue, the inturned runners 18 constituting means for causing the necessary contraction of the tool to permit the blades to enter. As the tool is moved in the tube, the edges 17 of the blades scrape it, the loosened material escaping through the slots 7 and not being packed in the head. The arms 19 also constitute means for properly deflecting the blades and the strips 5 when the tool is pulled back into a flue after it has been pushed therefrom.

Coupling.

A device for coupling pipes that combines several features of interest has been recently patented by Howard S. Kantz, of Burnside, Pa. The invention belongs to that class of couplings which are provided with means for connecting the sections together or unscrewing them, and it is especially adapted to secure a rubber pipe or hose to a metal pipe. The pipe section 1 (see drawing) has a head 2 at its forward end, in which is located a tubular projection 3, forming with the interior surface of the head 2 an angular socket 4. The section 1 is formed in the rear with an exterior theaded portion 5 terminating at its rear end in an annular shoulder 6, and having a tapering end portion 7 extending from this shoulder. Mounted on and overlapping this end portion is the end of a rubber pipe 8, and screwed onto the threaded portion 5 of section 1 is a sleeve 9, having a rearwardlyextending, tapering, smooth portion 10 between which and the portion 7 of section 1 is clamped the end of rubber pipe 8, the latter having its end abutting against the shoulder 6. By means of the tapering end portions 7 and 10, the pipe 8 will be firmly wedged and clamped by screwing the sleeve 9 on the section 1, and will be firmly held from pulling apart from the section. 11 is the threaded end of an iron pipe having mounted thereon and projecting beyond the same a

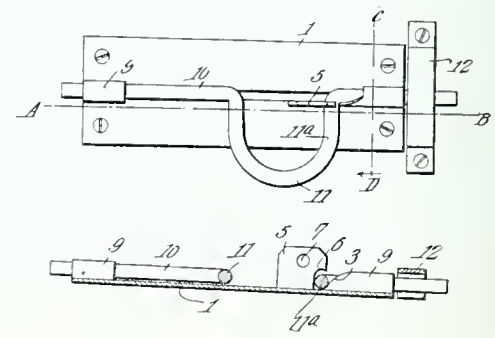


threaded sleeve 12, which when the pipe 8 is connected with the pipe 11 projects over the tubular projection 3 against a gasket 13, located in the inner end of the socket 4. This serves to enclose and thoroughly protect the gasket 13, and this gasket seals the connection between the pipe sections. The outer diameter of the tubular projection 3 is less than the inside diameter of the sleeve 12, by reason of which the threads of said sleeve are kept out of contact with said projection, and are thus protected from being injured thereby.

In order to lock the pipes together, an eccentric U-shaped lever 14 is pivoted on the pivot pins 15 projecting from the head 5, the lever 14 having pivotally connected to its ends the arms 16 of a yoke 17. In the figure, the coupling is shown in locked position, the yoke 17 engaging the pipe 11 behind the end of sleeve 12, and the lever 14 preferably standing out from the coupling whereby it may be easily handled to quickly unlock it. Mr. Kantz has devised several modifications, but the above shows the main embodiment of the invention.

Locking Bolt.

The number of bolts that has been invented is legion, but a recent patent offers elements of novelty and convenience, in the form of a bolt adapted to be used for either right or left hand doors, that can be readily fastened in shifted positions by means of a padlock, and held so as to prevent it from being withdrawn by live stock, and that further consists of but two parts—the base and guides and the slidable member. It is the device of Wm. T. S. Dickey, of Mineralbluff, Ga. The base plate has a slot with a diagonal wall, 3, at one end and an ear 5 formed integral with one of its longitudinal walls. This ear has a notch 6 (designed to partly lap the diagonal wall) and an opening 7. The base is designed to be stamped in a single blank, folded along a longitudinal line so that the end portions form eyes 9 at the centers thereof, said eyes being disposed in alinement and constituting guides. The wall 3 constitutes a portion of one of the eyes and operates as a cam. The eyes 9 are designed to receive the end portion of a bolt 10 having an intermediate U-shaped portion 11, one arm of which reslides upon the cam 3 and is directed thereby into a notch 6. This is the position of the bolt when the same is held against retraction from its keeper 12. When the bolt is



retracted, the arched portion 11 rests between the ear 5 and the eye 9 that is located farthest from the cam 3. When it is desired to shift the bolt, the portion 11, which constitutes a handle, is swung upwardly into a plane above the ear 5 and slid over it until the arm 11*a* is brought into contact with the eye 9 having the cam 3 thereon. This movement is sufficient to project the bolt into its keeper 12. As soon as the limit of movement has been reached, the portion 11 is released and drops by gravity into a lowered position. The arm 11*a* rides downward on the cam 3 and is deflected thereby into the notch 6. It will be apparent that it is impossible to disengage the arched portion from the notched ear by simply swinging it vertically. Instead, it must be pushed upwardly along the cam until it passes out of the notch 6, whereupon it may be swung upwardly a sufficient distance to pass over the ear 5. This makes it impossible for cattle to raise the arched portion or shift the bolt. By placing a padlock within the opening 7, the bolt can be guarded against longitudinal movement and thus securely held within its keeper 12.

PATENTS

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LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

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E. L. WATROUS MFG. CO. v. AMERICAN HARDWARE MFG. CO.

(Circuit Court, N. D. Illinois, E. D. April 22, 1908. 161 F. R. p. 362.)

1. PATENTS—ANTCIPATION—LIMITATION BY PRIOR ART.

That the device of a patent never came into commercial use does not prevent such patent from being an anticipation of a later one, if it sufficiently embodies the elements and discloses the principle of operation of the latter, or from narrowing its scope; nor is it material that the earlier patentee did not claim the particular device of the later patent as a part of his invention.

1. SAME.

That the device of a later patent is a mechanical improvement on that of an earlier one and produces a better result does not prevent the earlier from being an anticipation, where the principle and mode of operation are the same.

O'CONNELL et al. v. NATIONAL WATER COMPANY.

(Circuit Court of Appeals, Third Circuit. May 13, 1908. 161 F. R. p. 545.)

TRADE-MARKS AND TRADE-NAMES—UNLAWFUL COMPETITION-DECEPTION OF PUBLIC.

In order to entitle complainant to relief in a suit for unlawful competition, it is not necessary that the public should be actually deceived; it being sufficient that the infringement had a tendency to deceive.

MORTON TRUST CO et al. v. AMERICAN CAR & FOUNDRY CO.

(Circuit Court, D. New Jersey. May 29, 1908. 161 F. R. p. 546.)

1. PATENTS-SUIT TO ENJOIN INFRINGEMENT-NECESSITY OF NOTICE OF PATENT.

Rev. St. § 4900 (U. S. Comp. St. 1901, p. 3388) requires patented articles to be marked or notice of the patent to be given to a defendant only as a prerequisite to the recovery of damages for its infringement, and such notice is not essential where the only purpose of the suit is to enjoin future infringements.

2. SAME—SUIT TO ENJOIN INFRINGEMENT—EQUITY JURISDICTION.

The fact that the device of a patent has never gone into commercial use does not preclude the owner of the patent from maintaining a suit in equity to enjoin its infringement.

EDISON ELECTRIC LIGHT CO. v. NOVELTY INCANDESCENT LAMP CO.

(Circuit Court, W. D. Pennsylvania. May 7, 1908. 161 F. R. p. 549.)

PATENTS-INVENTION-INCANDESCENT LAMPS.

The Edison reissue patent No. 12,393, (original No. 444,530), for a leading-in wire for incandescent lamps, consisting of two copper wires connected by a short joint of platinum wire extending part way through the glass of the bulb, both joints between the copper and platinum being sealed in the glass, is void for lack of invention. It was previously known that such joints could be made and sealed in the glass; but it was believed that in such case the expansion of the copper would break the glass, and the discovery that such belief was erroneous was of a mechanical truth, and not an inventive act.

ELECTRIC CANDY MACH. CO. v. EMPIRE CREAM SEPARATOR CO.

(Circuit Court, D. New Jersey. May 16, 1908. 161 F. R. p. 554.)

PATENTS—INFRINGEMENT-CANDY MACHINE.

The Morrison and Wharton patent, No. 618,428 for a candy machine, claim 1, contains but two elements, a rotative perforated vessel, and a heating attachment or burner By referring to the vessel as "the vessel, A, A, A," C, C'," the part, A" as shown in the drawings, is not made an element of the claim; but the letters are merely used as designating the vessel described as an intirety. As so construed, said claim held infringed.

BONSALL v. T. B. PEDDIE & CO. SAME v. AMERICAN SPECIALTY CO. SAME v. STRAUSS et al.

(Circuit Court, S. D. New York. May 29, 1908. 161 F. R. p. 564.)

1. PATENTS-VALIDITY AND INFRINGEMENT—WARDROBE TRUNK.

The Bonsall patent, No. 604,346, claim 3, for a trunk adapted for hanging therein ladies' dress skirts and other garments so they may be carried without crushing, discloses novelty and patentable invention, and is of a pioneer character. Claims 4 and 5, for hanger frames for garments, are void for lack of patentable invention, in view of the prior art. Claim 3, also, held infringed.

2. SAME—RECEPTACLE FOR CLOTHING.

The Bonsall patent, No. 642,075, for improvements in receptacles for garments consisting of frames and hangers, claims 3 and 4, are void for lack of invention. Claim 5, which covers a device by which the suspended garments are made to incline inwardly and press together, in view of the novelty and utility of such device and its commercial success, must be conceded patentable invention and given a liberal construction as a pioneer. As so construed, held infringed.

WILLIAMS v. SYRACUSE & S. R. CO.

(Circuit Court, N. D. New York. May 11, 1908. 161 F. R. p. 571.)

PATENTS—DESIGNS—INSULATING PLUG FOR ELECTRIC-LINE SUPPORTS.

The Williams design patent, No. 31,838, for a design for an insulating plug for electric-line supports, is void, because the article shown is not a proper subject for a design patent, not being intended for display or ornament, and when in use being covered, so that the design cannot be seen, also for anticipation and lack of invention, in view of the prior art, it being shown that the alleged infringing article was made, advertised, and sold several years before the patent was applied for.

LICHTENSTEIN v. PHIPPS.

(Circuit Court, S. D. New York. May 26, 1908. 161 F. R. p. 578.)

PATENTS—INFRINGEMENT-DESIGN PATENTS.

A manufacturer who applies a patented design to an article of manufacture for the purpose of sale without license from the owner of the patent is not relieved from the statutory liability of $250 for infringement provided by Act Feb. 4, 1887, c. 105, § 1, 24 Stat. 387 (U. S. Comp. St. 1901, p. 3398), by the fact that he had no actual knowledge of the patent, where the articles sold by the patentee were duly marked.

2. SAME—MARKING PATENTED ARTICLES.

Notice of a design patent for a hatband was sufficiently given under Rev. St. § 4900 (U. S. Comp. St. 1901, p. 3388), by placing the words, "Pat. Jan. 15th, 1907," on the lining of the hats on which the bands were used.

ST. LOUIS STREET FLUSHING MACH. CO. et al v. SANITARY STREET FLUSHING MACH. CO.

(Circuit Court of Appeals, Eighth Circuit. April 6, 1908. 161 F. R. p. 725.)

1. PATENTS—SUIT FOR INFRINGEMENT—PRELIMINARY INJUNCTION.

A prelimiuary injunction should not be granted in a patent case, without a showing that the patent in suit has been adjudged valid by a court of a competent jurisdiction, or that its validity has been generally acquiesced in by the public or has been admitted by defendant.

ESTOPPEL—SUIT FOR INFRINGEMENT- ESTOPPEL TO DENY VALIDITY.

The fact that one of the assignors of a patent subsequently became associated with others, and with them is charged with infringement of such patent, does not estop them to deny its validity, where the relations between the defendants are not shown.

DRAPER CO. v. AMERICAN LOOM CO. et al.

(Circuit Court of Appeals, First Circuit. April 8, 1908. 161 F. R. p. 728.)

1. PATENTS—INVENTION AND INFRINGEMENT LOOMS.

The Rhoades patent, No. 454,791, for an improvement in looms, was not anticipated, and, while a narrow one, discloses invention; also held infringed.

2. SAME—SUIT FOR INFRINGEMENT—NATURE OF RELIEF.

Where a patent, at the time of a decree adjudging its infringement, has but a short time to run and is for a minor part of a machine, by reason whereof the defendant is liable, if enjoined, to suffer a loss out of proportion to the value of the transaction, the court may, in its discretion, instead of granting an injunction, permit the defendant as an alternative to compensate the complainant or to secure such compensation.

D'ARCY v. STAPLES & HANFORD CO.

(Circuit Court of Appeals, Sixth Circuit. May 19, 1908. 161 F. R. p. 733.)

1. PATENTS—EFFECT OF PRIOR ADJUDICATION-PERSONS AND MATTERS CONCLUDED.

A decree adjudging the validity and infringement of a patent in a suit defended by the manufacturer of the infringing device, who, although not a party to the record, had complete charge and control of the defense, is conclusive upon him, in a subsequent suit brought against him by the same complainant, as to all matters of fact and law necessarily litigated and determined, which include the validity of the claims involved and infringement by the particular device in suit; but such decree is not conclusive on the question of infringement by other devices which may fairly be differentiated from the one in suit.

2. PATENTS — CONSTRUCTION OF CLAIMS—SUBSEQUENT PATENT TO SAME PATENTEE.

A second patent applied for by and granted to a patentee for a device for the same purpose, but different in form from one shown in an earlier patent, may be taken into consideration in construing the earlier patent, as affording a presumption that it did not broadly cover other forms than the one described.

3. SAME—INVENTION.

There is no invention in making two parts of one thing or one part of two, when by such change no different result is attained.

WILLCOX & GIBBS SEWING MACH. CO. v. INDUSTRIAL MFG. CO. et al.

(Circuit Court, D. New Jersey. May 28, 1908. 161 F. R. p. 743.)

PATENTS-INFRINGEMENT-SEWING MACHINE.

The Willcox & Borton patent, No. 472,094, for improvements in sewing machines, claim 1, construed in the light of the specification and drawings as required by its closing words, "substantially as described," has as one element of the combination therein claimed a single-implement, double-jawed, looper, and is not infringed by a machine having a two-implement looper; the two parts being separately operated.

UNION SPECIAL MACH. CO. v. MAIMIN.

(Circuit Court, E. D. Pennsylvania, May 12, 1908. 161 F. R. p. 748.)

1. PATENTS — CONTRIBUTORY INFRINGER—REPAIR OF INFRINGING DEVICE.

A repairer who supplies an essential part of the patented combination for an infringing machine thereby becomes a contributory infringer.

2. SAME.

The infringement of a patent initially by one person gives no sanction to another to repeat or continue. No doubt within certain bounds a patented article may be repaired without making the repairer an infringer; but not where it is done for one who is. It is only where the device in patented form has come lawfully into the hands of the person for or by whom it is repaired that this is the case. In other words, if one without right constructs or disposes of an infringing machine, it affords no protection to another to have merely repaired it; the repairer, by supplying an essential part of the patented combination, contributing by so much to the perpetuation of the infringement

3. SAME—SECONDHAND SEWING MACAINES.

Complainant was the owner of a patent for a thread-controlling device for sewing machines, and manufactured and sold machines both with and without such device. Certain machines sold by it without the device were bought at secondhand by defendant, equipped by him with the device, and resold, an additional eyelet necessary for such equipment having been purchased from an agent of complainant. Similar eyelets were of common use on sewing machines for a different purpose, and the use for which those bought by defendant were intended was not stated. Whether such machines had previously been equipped with the patented device by another than defendant did not clearly appear. Held, that whether they had or had not been so equipped was immaterial, and that in either case defendant was an infringer, as no license to make or use the patented device could be implied from the sale of the part by complainant under the circumstances.

WILLIAM WRIGLEY, JR., CO. v. GROVE CO. et al.

(Circuit Court, S. D. New York. May 20, 1908. 161 F. R. p. 885)

1. TRADE-MARKS AND TRADE-NAMES-WORDS SUBJECT TO APPROPRIATION—"SPEARMINT."

The word "spearmint" is a common English word, descriptive in its nature, and not subject to exclusive appropriation as a trade-mark for chewing gum flavored with spearmint.

2. SAME—UNFAIR COMPETITION—PRELIMINARY INJUNCTION.

The showing made held not to establish unfair competition by defendant by imitating complainant's cartons and packages containing chewing gum, such as to warrant the granting of a preliminary injunction.

CONSOLIDATED LOOPS CO. v. BARNUM & BAILEY, Limited.

(Circuit Court, S. D. New York. June 5, 1908. On Rehearing June 12, 1908. 161 F. R. p. 915.)

PATENTS—INVENTION—AMUSEMENT APPARATUS.

The Eggers patent, No. 737,375, for an amusement apparatus comprising an inclined track adapted to be traversed by a vehicle, an upwardly inclined ledge at the bottom, a gap, and means for arresting the the flight of the vehicle after it has passed the gap, is void for lack of patentable invention, in view of the prior art.

HILDRETH v. BEE CANDY MFG. CO.

(Circuit Court, W. D. Texas, San Antonio Division. June 10, 1908. 162 F. R. p. 40.)

PATENTS—SUIT FOR INFRINGEMENT—SUFFICIENCY OF BILL.

A bill for infringement of a patent, which makes profert of the patent, is not demurrable because it gives only a general description of the patented device.

AMERICAN CARAMEL CO. v. THOMAS MILLS & BRO.

(Circuit Court of Appeals, Third Circuit. April 6, 1907. 162 F. R. p. 147.)

1. PATENTS-SUIT FOR INFRINGEMENT-SCOPE AND EXTENT OF RELIEF.

Only under exceptional circumstances will a court, in its decree finding infringement of a patent, provide that the infringing machines shall be delivered up to the complainant to be destroyed.

2. SAME — DAMAGES — FAILURE TO MARK PATENTED ARTICLE.

Where put in issue, the complainant in a suit for infringement of a patent for a machine is required to prove affirmatively that machines made thereunder were marked as required by Rev. St. § 4900 (U. S. Comp. St. 1901, p. 3388), or that notice of infringement was given to the defendant, to entitle complainant to recover damages for infringement prior to the filing of the bill.

ROTH et al. v. HARRIS.

(Circuit Court, N. D. New York. May 28, 1908. 162 F. R. p. 160.)

1. PATENTS—INVENTION—ATTACHMENT FOR PIANO PLAYERS.

The Whitmore patent, No. 791,967, for an attachment for piano players, is void for lack of novelty and patentable invention.

2. SAME—INFRINGEMENT.

The Hobart patent, No. 765,240, for a tune sheet attachment for piano players, was not anticipated and discloses invention in respect to the detachable box containing the tune sheet and feed roller. Also, held infringed.

MECHANICAL INVENTIONS AND DESIGNS.

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Walter S. Davis, Ruston, La., inventor: Ben F. Smith, assignee one-half interest, same place. Detachable Hoe.—The invention relates to an improvement in hoes of that class especially adapted for cultivating cotton or the like, and has for its object to provide a novel means for detachably securing a reversible blade in place, the said blade being adapted for use either as a chopping hoe, or as a scraper, whenever it is desired to push or scrape young grass, etc., from the off-side of a plant.

Claude Siebring, George, Iowa. Two patents. Gates.—An object of the invention of the first patent is to produce a swinging gate, adapted to be readily opened and closed at a distance from either side of it without dismounting from a horse or leaving a vehicle. Another object of the invention is to provide a gate of this character, which, when closed, will be firmly locked in such position to prevent hogs and cattle from opening it.

It is the aim of the invention of the second patent to provide gate-operating mechanism, adapted to positively open and close a gate at a distance from either side of it, and capable of securely locking the gate in its closed position and of retaining the same in its open position until positively closed by the operating means.

Frederick Sandwisch, Woodville, Ohio. Hoisting Apparatus and Transporting Means Thereof.—This invention relates particularly to derricks employed in oil fields and similar places where piping, pumps, and the like have been raised from the wells or holes in the earth, and has for its object to provide such an apparatus which can be transported from place to place; properly positioned with ease and expedition and raised to operative condition.

Zadock B. Starr, Gloversville, New York. Power Transmitting Mechanism.—This invention relates to a mechanism for transmitting power from a driving member to a driven member, and is particularly intended for transmitting power from a motor of a self-propelled vehicle to the wheels thereof, and has for its object to provide a mechanism whereby the parts to be driven may be operated at different rates of speed, their direction readily reversed, or said parts maintained at a standstill while the motor or driving member is running at a constant speed.

Harvey P. Becker, Gloversville, New York. Ironing Machine.—This invention has for its object to provide a novel construction of ironing machines, which is adapted for ironing leather, clothes or other material with either a single or double stroke, and capable of affording free movement of the material beneath the iron to enable any portion of the material to be ironed, and of automatically ironing the leather from the center to the outer edge, whereby the grain is ironed out of the leather and the latter polished and starched.

Adam H. Uhrig, Gallipolis, Ohio, inventor; D. E. Roberts, assignee, same place. Embossing Press.—This invention has for its object to provide a novel and exceedingly simple and inexpensive mechanism which is entirely effective for the purpose, and will permit of a ready change of dies and will also accomodate itself to the varying thicknesses of the sheets, cards, or the like operated upon.

Ira A. Rohrer, Boise, Idaho, inventor; David B. Camp, assignee, one-half interest, same place. Stove Pipe Holder.—This invention relates to means for holding stove pipes that pass through tent walls or roofs, at the same time protecting the fabric of the latter from becoming ignited because of its close association with the pipe, and has for its principal object to provide a structure that can be quickly applied to, and detached from a tent, and will properly turn the water from the stove pipe opening therein.

Charles M. Weaver, Bessemer, Ala. Power Operated Shovel.—This invention is adapted particularly for handling coke, and has for its principal object to provide a mechanism for moving a shovel or other carrier in practically any desired direction so that the same may be readily loaded, the load transported, and said load deposited from the machine at different points; and to provide a power-operated traction machine wherein the driving power may be wholly utilized, either for propelling the machine or for operating the shovel.

Willie A. Hammer, Eufaula, Okla. Stove.—The object of this invention is to improve the construction of stoves, and to provide a structure wherein the products of combustion are retarded and passed over comparatively large radiating surfaces so that the heat contained in the said products of combustion will be given up, and its loss prevented, the arrangement also serving to economize in the amount of fuel consumed.

Samuel A. Jones, Deshler, Ohio. Three patents.—The first invention relates to improvements in machines for molding articles made of cement and other plastic materials, and particularly for making tiles for roofs and like structures, and has for its principal object to provide such a machine of simple construction, which will mold roofing tiles with their faces either up or down.

The second patent relates to corn poppers, and has for its principal object to provide a simple and effective means for detachably securing the handle of the popper to the receptacle or body, said means when in place constituting an effective rigid connection, but permitting the detachment of the parts for the purpose of storage or transportation. The invention also provides a seasoning cup in the cover whereby butter can be readily applied to the corn during the popping operation, without turning the corn thrown. A novel and simple locking means for the cover is provided to hold it in either an open or closed position.

The third patent relates to roofing tiles made of cementitious material, and has for its principal object to provide a tile having the part of the face seen in position broken up into four parts, which resemble in appearance tiles of one-fourth the size of the actual tile. Inasmuch as tiles of such a small size cannot be made commercially, the breaking up of the surface gives a diversified and pleasing appearance to the roofing. The invention also provides means for strengthening the tiles by the provision of ribs running from side to side of the tile.

Edward H. Proffit, Radford, Va., inventor; Lynchburg Foundry Co., Lynchburg, Va., assignee of one-half interest. Core Arbor.—This invention relates to arbors or supports employed in green sand and like cores used in casting pipes and other analogous articles. The principal object of the invention is to provide a sectional arbor, which can be readily put together, and when assembled constitutes an efficient, rigid structure, for the purpose specified, the parts moreover being so related and connected that they may be easily disassociated and withdrawn from the surrounding article after the same has been cast.

Edward H. Proffit, Radford, Va. Core Arbor.—The invention relates to cores for pipes and tubular structures, and has for its object to provide a core made of sections that can be separately prepared for casting purposes, and afterwards joined, said core being very simple in construction and cheap both to manufacture and to use.

John L. Lamboley, Fort Wayne, Ind. Paper Roll Holders.—This invention relates to printing means to be employed in connection with rolls of wrapping paper, for the purpose of printing advertisements, etc., and has for its object to provide means of this character, that can be readily attached to a roll holder, will print the desired matter clearly upon the paper, and will blot or dry the ink immediately after printing.

Theodore H. Bauer, Middletown, Ohio. Two patents.—The first invention relates more particularly to means for locking covers or closures to boxes, cases, crates, and the like, and has for its object to provide a novel locking means whereby the closure may be thoroughly locked in closed or operative position, and the locking means may be securely maintained in action and against accidental displacement.

The second patent relates to devices for adjusting back curtains of vehicles, and has for its object to provide a simple and efficient device which is adapted to be readily applied to a vehicle, and capable of enabling the back curtain to be raised and held at any angle.

David W. Inman, Versailles, Ohio. Table.—This invention relates to tables and particularly to knock-down or folding tables, and has for its object to provide a structure that can be employed for a great variety of purposes, and is so constructed that it may be readily folded and set up, thereby making it easily portable, the structure moreover being cheap to manufacture, and when folded or knocked down, occupying but very little space.

Thomas T. Hosack, Oil City, Pa., inventor; H. A. Landis, Du Bois, Pa., assignee of two-thirds interest. Solder for Aluminum.—This invention relates to means for soldering aluminum, either aluminum parts together or aluminum to other metals, and has for its object to provide a non-oxydable solder composed of inexpensive ingredients that can be melted together in practically any melting pot.

Henry Anderson, Vega, Washington. Sawing Machine.—This invention relates to manually operated sawing machines, and has for its object to provide a machine which can be readily applied either to standing or prostrate timber, is easily adjustable to trees, logs, or beams of different sizes, and will properly hold the saw to its work throughout the cutting operation.

Loderick Williams & Herman C. Brennecke, Doe Run, Mo. GraveVault.—The object of this invention is to provide a novel structure made of parts that can be readily molded and easily assembled, the vault being so arranged that when the parts are assembled, the joints can be effectively sealed.

Marshall Henson, Doe Run, Mo., inventor; Ulysses Hawk, assignee of one-third interest, same place. Ore Feeder.—This invention relates to means for feeding crushed ore and the like to belt conveyers or other suitable mechanism, the said feeding mechanism being adapted to be thrown into and out of operation as desired.

Elbert R. Morgan and Carl A. Erickson, Forest Grove, Mont. Fire Escape.—This invention relates to fire escapes employed as part of the equipment of a fire department, and has for its object to provide one which can be compactly folded for transportation, can be readily and quickly extended to practically any height, and will constitute an effective and safe means of escape for the occupants of burning buildings, as well as an elevated support from which the firemen can fight flames with good effect.

William A. Teall, Eau Claire, Wisc. Hose Nozzle.—This invention relates to hose nozzles, and bas for its object to provide a nozzle which shall act in the double capacity of a plain nozzle and sprinkler, and also be adapted for use in connection with an attachment whereby the water issuing from the nozzle may be broken up into a fine spray or mist.

James B. Righter, River Falls, Wisc. Artificial Tooth Crown and Bridge Work.—This invention relates to means for securing artificial teeth in place, and has for its object to provide novel means for effectively securing the teeth in place, so that they will be completely re-enforced to prevent damage thereto, and yet if injured, are so arranged that they may be easily, quickly and cheaply repaired.

Frank P. Johnson, Danville, Pa. Garment Hanger.—This invention relates to improvements in garment hangers, and has for its object to provide a novel structure which is very cheap to manufacture, does away with the necessity of soldered joints, and is as substantial and effective as those now in general use.

Frederick B. Glenn, Lynchburg, Va., inventor; James H. Guthrie, assignee of one-half interest, same place. Adding Machine.—The object of this invention is to provide a means for adding numbers whereby this operation can be mechanically performed without the necessity of any involved mental calculations.

James R. Shipman and Joseph S. Click, Bridgewater, Va. Umbrella.—The object of this invention is to provide an umbrella of simple and effective structure, which can be raised and lowered in the ordinary manner, and when raised will have the handle located at one side of the center, leaving the central portion of the covered space unobstructed so that it can be occupied by the user of the umbrella.

Benjamin M. Carr, Houston, Texas. Car Wheel Chill.—This invention relates to contracting chills for car wheels and the like, and has for its object to provide a chill which will retain its shape and hold the parts in proper associated relation; it also provides means for effectively venting the gas, and can be handled and used in connection with the ordinary foundry mechanism.

Walter M. Cross, Kansas City, Mo. Gas Generator.—The object of this invention is to produce an apparatus for generating what is known as producer gas from a body of coal, in a novel manner which will insure the heating of the air to a high temperature before it is admitted to the generator, thus avoiding cooling of the latter and facilitating the production of gas rich in hydrogen.

Herman Wulff, Toledo, Ohio. Ice Cutting Machine.—This invention relates to means for scoring ice fields, and has for its object to provide mechanism whereby ice of different thicknesses may be cut and the depth of the cut readily regulated.

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FOR SALE—Patent No. 924,514, dated June 8, 1909. This is a great money saving device for railroads. No more batted joints. Will greatly increase the life of rails. Will sell outright or on royalty basis. Address, John Warchock, Box 43, Seney, Mich. feb '10

FOR SALE—Patent No. 917,951. Bitt. Calf, colt, cow weaner. Will sell right. The present invention inserted in the mouth of the animal suffering with clot will save it from dying. Address, J. C. Krause, Bessie, Okla. dec

FOR SALE—Patent No. 902,746, issued Nov. 3, 1908. Self-fastening Hook-and-Eye: no sewing, quickly attached, can be used wherever ordinary hooks-and-eyes are used, cheap to manufacture. Will sell for $800. Address, Harriet N. Legan, 677 South Pennsylvania Street, Denver, Colorado. dec

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FOR SALE—Patent on Time and Interest Calculating Sheets. The simplest and most available means ever devised for reckoning time and interest. Costs little to make and could be sold freely at handsome profit. A money-maker. For sale, cash or royalty. Address, Walter Sparklin, Petersburg, Va. dec

FOR SALE—Patent No. 917,595, issued April 6, 1909. A folding canvas cot. Splendid for children and especially adapted for outdoor use. Will sell for part cash and small royalty. Address, Mrs. Emma Grant, Cloquer, Minn. nov

FOR SALE—Patent No. 922,274. The latest and best glass front combined display and stock rack for postal cards. No more soiled or stolen cards. No mixing of cards in racks. Address, Alva Post Card Co., Alva, Oklahoma. nov

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FOR SALE—I will sell outright, or will sell state or county rights, or have manufactured on a royalty, my holder for fruit jars. U. S. patent No. 925,315. Write me for copies if you are interested. Address, James G. Dutschke, Cecilia, Kentucky. nov

FOR SALE—Pat. No. 917,647. Safety Cartridge Loader. A life saving device for miners using black blasting powder. Can be manufactured cheaply. Will sell outright or on royalty. For further particulars address, Arthur D. Otto, Hegins, Pa. nov

FOR SALE—Double acting gas engine. Simplicity itself. Double power. Saves fuel. Mechanics will recognize this as a great stride in gas engine improvements. Will consider royalty. Address, G. H. Marquardt, South Haven, Kansas. nov

FOR SALE—Patent No. 918,149, dated April 13, 1909. Hoof pad, for soaking horses hoofs. Has pad for bottom of hoof and pad for front of hoof. Will sell patent outright for $1,000. Just what the veterinary surgeon needs. Address, William Heathermon, Kneeland, Wisconsin. nov

FOR SALE—A patent hose-nozzle No. 860,054, issued July 16, 1907. Its advantages over all others are three. First, you can throw one-third more water; second, throw as much when spraying as when throwing a solid stream; third, relieve the hose of all back pressure. Will sell outright, cheap. Address, George Pecover, No. 611 N. Spruce St., Colorado Springs, Colo. nov

FOR SALE—Patent No. 919,083. Money holder for mail boxes, patented April 20, 1909. A tin device which can be cheaply manufactured. Will sell outright or by states. Address, Frank Spenner, Route 1, Stayton, Oregon. oct

FOR SALE—I have a valuable patent for sale. The best of its kind. Will sell outright for a reasonable price if sold quickly. The said patent is an improvement in trace carriers. For particulars, address, S. M. Wold, Box 303, Estevan, Sask., Canada. oct

FOR SALE—No. 891,875, issued June 30, 1908 and patent No. 902,624, issued Nov. 3, 1908, The Wisconsin Litter Carrier. For sale for $5000; or $2500 cash and $1.00 royalty on each one sold. The best working carrier on the market. Address Byron Snyder, Clinton, Wisc. oct

FOR SALE or Partner—Patent No. 891,739, dated June 23, 1908. Skirt supporter for holding up ladies' skirts while walking or crossing muddy streets. Have dies ready for manufacture. Will sell for cash on easy terms or take good partner. Can get manufactured very cheaply. Address, Walter W. Schwotzer, Rodfield, Pa. oct

FOR SALE—Patent No. 920,685. Requires only one-tenth as much oil as other wheels. Axles run in oil. No waste, no friction. Can manufacture as cheaply as common wheels. A money maker. Will sell outright or half interest. Address, J. S. Strawn, Avonmore, Pa. oct

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FOR SALE—Patent No. 922,053, May 18, 1909. Adjustable shingling gage. A time and labor saving device. Malleable cast. Large profits. U. S. rights $1500, Canadian rights $800, both for $2000. Address, William H. Smothers, Millston, Wisconsin. oct

FOR SALE—Patent No. 924,527, issued June 8, 1909. Phonograph stop. Needed on every cylinder phonograph in U. S. It stops the machine as soon as the record is finished and prevents injury to same. Will sell outright or state and county rights. Address, F. H. Andrews, Watsonville, California. oct

FOR SALE—Patent No. 917,911, issued April 13, 1909. Simple, effective, durable and easily repaired. A perfect substitute for expensive gate valves at the ends of any kind of pipe or tiling. Price $5000. Address, A.C. Thompson, Falfurrias, Texas. oct

FOR SALE—Patent No. 918,445, issued April 13, 1909. This invention is a cultivating attachment for any sort of turning plow. Will cultivate each furrow at the same time it is plowed. Write for full information and terms. Address, N. C. Y. Gundholm, R.F.D. No. 1, Box 30, Tallahassee, Fla. oct

FOR SALE—Patent No. 620,239, issued May 4, 1909. Mail Receiver and Deliverer. Will sell outright at a reasonable price. For particulars, address Joseph O. Anderson, Bercail, Mont. mar '10

FOR SALE—Patent No. 912,708. Hand massage machine. Only one of its kind in the world. Will sell you all rights, including tools for making same, and turn over orders for 15,000 machines. Money wanted to invest in another line at once. A snap, and will be sold in a few days. Address Box 816 A. Kalamazoo, Mich. oct

FOR SALE — Two Patents on Trunk-Tray Form, U. S. Patent No. 870,949, issued Nov. 12, 1907, Canadian Patent No. 116,503, issued Feb. 9, 1909. This is a great labor saving device. Will accept the first reasonable offer. Address, Walter S. Gilson, 347 S. State St., Chicago, Ill.

FOR SALE—Pateut No. 925,494. For Multiple Drill. Something that is simple but fills the bill in every way. Address, Herbert E. Hawes, No. 777 Union St., Manchester, N. H. nov

FOR SALE—Patent No. 926,360, dated June 29, 1909. Egg Beater. Works perfectly, beating the white and yelk separately at the same time. Wish to have it manufactured on royalty or will sell part interest. Address, Mrs. Fannie H. Speer, Cornelia, Georgia. nov

FOR SALE—Patent No. 899,489, dated Sept. 22, 1908. Pick Ax Guard. A device that is much needed in rock work and coal mines. Saves the handle from wearing out and keeps it solid in eye of pick. A simple working device. Cannot be a better one invented. Would like to hear from any one who buys patents. Address, T. W. Gordon, East Franklin, Maine. feb '10

FOR SALE—No. 918,163, dated April 13, 1909. Window Opening and Closing Device. Automatically maintains temperature of room normal. Very valuable patent. Address, Lee O. Kemp, Fouke, Ark. oct

FOR SALE—Patent No. 923,153, dated June 1, 1909. Window Guard. Great money maker. Want correspondence with honest men and manufacturers to place window guards on the market. Sell part cash and royalty. Write for a copy of the patent. Max R. Dennhardt, Box 802, Honesdale, Pa. oct

FOR SALE—Patent No. 922,975, dated May 25, 1909. Cheap, simple and effective double-acting door latch. Holds door open or shut. Price very reasonable. For particulars address, E. H. Todt, R. R. No. 2, Morrisonville, Illinois. nov

FOR SALE—Patent No. 822,828. Railway Crossing. Carries car over crossing track. Saves cutting rails. Desirable where interurban crosses steam roads $800 cash if taken quickly. Address, R. W. Cress, Rosedale, Indiana. nov

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FOR SALE—Patent No. 901,917, outright. A very valuable and useful crib made of wood. Can be manufactured very cheaply. Address, Theodore Kreisel, Warrenton, Va. dec

FOR SALE—Patent No. 908,742, dated Nov. 10, 1908. Dividing board for mowing machines. If stump or any obstruction is struck it folds toward machine and unfolds when machine starts forward. If sold soon will take $2,500, or might sell state rights or sell to manufacturer on royalty. Address, Ralph Loving, Powell, Wyo. nov

WANTED.

WANTED—I will furnish money to patent meritorious inventions. Write me etc., F. B. Conine, Clifton, Texas. oct

WANTED—To place on a royalty patent No. 928,101, issued July 13, 1909. Improvements in handles for cooking utensils. R. R. Brakeman, 316 Kirkland St., Palatka, Fla. dec

WANTED—Owner of Patent No. 896,133, is arranging Mfg. Co., and wants others having small patented articles or ideas to join him, with a view of placing our own inventions on the market. Address, Mayer Mfg. Enterprise, Minneapolis, Minn. dec

WANTED—A company to buy or manufacture on royalty patent No. 884,672, apparatus for sharpening lawn mowers. A good seller wherever grass grows and lawn mowers are used. Address, H. E. W. Loomis, Dumont, Iowa. nov

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WASHINGTON, D. C., OCTOBER 1, 1909.

Our Complex Patent System.

There is a commendable movement on foot to simplify Court procedure, and to reduce the cost of litigation so as to make it possible for a poor but honest litigant to get his rights. The President, in a speech before the Virginia bar association last summer, pledged his support to a plan to correct present conditions, and a commission of which he is ex-officio chairman has the matter under consideration. Steps will probably be taken at the next session of Congress to amend the rules of the Federal Courts. Any action recommended by the commission would no doubt be taken up by the State Courts, and thus a general movement for simplifying the rules of practice before the courts would be started.

The need of some such reform is recognized throughout the country. One of the most influential of our financial magnates recently declared:

"We have complicated our law-making until, despite the high standards, the unimpaired traditions and the continual labors of the courts, the administration of justice is difficult.

"Equality before the law is the first principle sought to be established by the Federal constitution. In so far as we have been faithful to it, we have grown great and prosperous. In so far as we have denied it, in so far as there is anywhere a special privilege or an unequal restriction, we have changed the government of the fathers and turned backward toward the old, evil traditions whose trail of blood and oppression runs through all history.

"It needs heroism: it demands the repeal of laws framed to give to one an undue advantage, or take away from another a fair field and an equal judgement: it may even require a considerable readjustment of our whole industrial system and a reform in our very conception of the relation between a government and its citizens, before the severe standard of absolute equality before the law can be restored."

One would hardly expect to hear such expressions from the source quoted, because it is the rich who profit by the complex character of the laws. They can afford to hire the cleverest lawyers and keep the matter dragging in the courts, while a poor man is inclined to accept anything in the shape of a compromise, rather than become entangled in litigation. To the same extent that we have made our laws complex, we have complicated the system under which patents are granted. Take as a single instance the method of deciding questions of priority of invention. When two or more persons apply for a patent on the same device, the Patent Office declares an interference, and proceedings are instituted for ascertaining the relative rights of the claimants for the patent. After the declaration of interference, a certain time is given for the preparation of a preliminary statement, in which each inventor seeks to set forth his dates of conception and disclosure and the subsequent steps in the completion of the invention. These statements are filed, and on a certain date, opened in the Patent Office. Naturally one applicant does not know the dates claimed by the others, and each gives the earliest dates that he can substantiate by testimony. Then a period is set for the taking of testimony, which must be before a notary public in the form of depositions. These latter must be printed before they are considered, and on a date subsequently fixed the case is argued before the Examiner of Interferences. From his decision an appeal can be taken first to the Board of Examiners in Chief, then to the Commissioner of Patents in person, and finally to the Court of Appeals of the District of Columbia. Indeed a dissatisfied applicant need not stop there. He can initiate a new proceeding, and by a course of appeals carry the case to the Supreme Court of the United States. This is the direct procedure of determining questions of priority: but there is hardly an interference in which a motion to amend a preliminary statement, or to dissolve an interference or to take some other dilatory action, is not presented. It will doubtless surprise those not familiar with the subject, to learn that there are nearly 100 rules or sections in the rules of practice of the Patent Office, devoted to the preparation and filing of preliminary statements, motions for dissolution and amendment, and the procedure in taking testimony and appeals. As if this were not enough, there are many unwritten points in the practice which can only be ascertained by examining a host of decisions. Indeed the interference practice before the Patent Office is unique in many respects, and so different from the procedure adopted by the Equity Courts, that an old equity practitioner finds himself at sea when he first takes up the prosecution of an interference case.

There is no power in the Patent Office to secure the attendance of witnesses whose depositions are desired as evidence in contested cases, and when a contestant desires such testimony he is compelled to apply to the nearest Federal Court for a subpœna. Moreover, if a witness refuses to answer a question, there is nothing for an attorney to do but to apply to a Federal court for an order compelling him to answer. Because of this condition, it has often been proposed to relegate these interference matters to the courts, and some day a plan may be devised which will bring about this change. Since the Patent Office cannot control the attendance of witnesses, and all it can do is to suppress a deposition improperly taken, it would be in the interest of the contestants for a court—such as one of the courts of the District of Columbia—to take the matter in charge and decide the whole question of priority outside the Patent Office, the Commissioner of Patents subsequently issuing the patent to the one adjudged to be the prior inventor. But we might learn something in this matter from our neighbor on the north. The methods employed in Canada to determine questions of priority are simplicity itself. The rules are so plain that no lawyer is required to interpret them. They are as follows:

1. In case of conflicting applications for any patent, the same shall be submitted to the arbitration of three skilled persons, two of whom shall be chosen by the applicants, one by each, and the third of whom shall be chosen by the Commissioner; and the decision or award of such arbitrators, or of any two of them, delivered to the Commissioner in writing, and subscribed by them or any two of them, shall be final, as far as concerns the granting of the patent.

2. If either of the applicants refuses or fails to choose an arbitrator, when required so to do by the Commissioner, and if there are only two such applicants, the patent shall issue to the other applicant.

3. If there are more than two conflicting applications, and if the persons applying do not all unite in appointing three arbitrators, the Commissioner may appoint the three arbitrators for the purposes aforesaid.

4. The arbitrators so named shall subscribe and take before a judge of any court of record in Canada, an oath in the form following that is to say:—

'I, the undersigned (*A. B.*), being duly appointed an arbitrator under the authority of the Patent Act, do hereby solemnly swear *or* (affirm *as the case may be*), that I will well and truly perform the duty of such arbitrator on the conflicting applications of (*C.D. and E.F.*) submitted to me.'

5. The arbitrators, or any one of them, when so sworn, may summon before them any applicant or other person, and may require him to give evidence on oath, orally or in writing (*or on solemn affirmation, if such applicant or person is entitled to affirm in civil cases*), and to produce such documents and things as such arbitrators deem requisite to the full investigation of the matters into which they are appointed to examine, and they shall have the same power to enforce the attendance of such applicants and other persons, and to compel them to give evidence, as is vested in any court of justice in civil cases, in the province in which the arbitration is held.

6. The fees for the services of such arbitrators shall be a matter of agreement between the arbitrators and the applicants, and shall be paid by the applicants who name them, respectively, except those of the arbitrator or arbitrators named by the Commissioner, which shall be paid by the applicants jointly. R.S., c. 61, s. 19.

Contrast the simplicity of this procedure with that obtaining in the U. S. Patent Office. One would think the latter practice was especially designed to involve as much expense as possible. A closely contested interference case cannot be carried through our Patent Office for less than $2,000 or $3,000, and many cost considerably more. The greatest item of expense is the matter of printing testimony. After a contestant has spent several hundred dollars in taking testimony on the typewriter, it seems an unnecessary burden to require him to print the testimony. Such printing usually costs $1 a page, and it appears superfluous, as typewriting is read as easily as printing. While it is perhaps a little more convenient to handle a printed pamphlet than a typewritten document, it would seem that the Patent Office could put up with a little inconvenience, to save such heavy expense to the litigants. And not only must the testimony be printed, but also the briefs filed in the case. Suppose we had the Canadian practice: there would be none of the dilatory motions and proceedings that here follow a declaration of interference, for as soon as it was declared, each party would choose an arbitrator. For instance, if there were two contesting applicants for the same patent, two arbitrators would be chosen, and a third selected by the Commissioner of Patents. Upon the decision of the arbitrators, or two of them, the Commissioner of Patents would award the patent to the successful applicant, for no appeals are allowed from the decision. The expense of such proceedings could be easily brought within $500, and instead of waiting from 1 to 3 years for the end of the interference, as often occurs in this country, the whole question could be settled within less than 6 months. It cannot be denied that under the present practice, many inventors are deprived of rights to which they are justly entitled, because of their inability to pay the costs of interference proceedings. Many a man has triumphed in a contest merely because he had the money to carry it through, when the right was on the side of the defeated applicant. Any plan which would decrease the expense in an interference without thwarting the ends of justice should be adopted, and we believe that the method in vogue before the Canadian Office offers the best and simplest solution of the problem.

After the President and the commission referred to have completed their investigation of the Federal courts with a view to simplifying the procedure, they should turn their attention to the patent laws. Trained lawyer as the President is, he could readily suggest a modification of the present practice which would reduce the cost of litigation to a point where the poor but worthy inventor could enter the contest with some chance of success. Of course there would be objection to the change on the part of those who profit by the present complex nature of the laws. It would mean fewer attorneys' fees, and some of the officials of the Patent Office would lose their occupations. The Office would probably not favor a plan as simple as that outlined; it would find fault with it on the ground of its simplicity. But it is just as important to simplify litigation in the Patent Office as in the Federal courts, and the demand for a change will soon become so urgent as to compel revision.

SCIENTIFIC PROGRESS.

Paper Teeth.

The novel idea of manufacturing false teeth of paper is reported by the exchanges from Germany. These teeth are prepared from wood pulp, of the same class that figures so largely in the manufacture of various novelties in the paper line. The new teeth are said to be entirely satisfactory in operation, retaining their color and being less liable to chip than ordinary false teeth.

Electric Sprinkling Car.

Electric street car sprinklers are ordinarily used by the car companies to sprinkle only the width of their own road bed. The sprinkler car may, however, be arranged to sprinkle the entire width of the street, and a city may profitably arrange with the traction company to sprinkle those streets on which the cars run. This method is successfully in vogue in the cities within the radius of the Niagara Falls power. A long arm supports the sprinkler pipe and extends almost to the curb. This arm and pipe are mounted on a swivel so that they may be swung back against the side of the car when not in use, and to clear obstructions. Two men are required for the work—a motorman and a man to operate the arm and controlling valve—and the work of sprinkling is accomplished with ease and rapidity.

Uses of Seaweed.

Another example of the potential wealth in waste materials is found in the uses to which seaweed can be put. These masses of vegetation which the tides cast up on the coast have been generally allowed to decay. There is an increasing tendency, however, to utilize them as fertilizer. For certain classes of truck they have decidedly beneficial qualities. Either fresh or dried, the weed is scattered as a top dressing over grass, or worked into the ground in the culture of potatoes, watermelons, etc. It contains nitrogen and potash and acts mechanically by attracting moisture, an advantage on light, open soils.

Another means of utilizing seaweed is in the manufacture of iodine. To obtain this the seaweed is burned, and the ashes are used in the production of chemicals. It is said that the best kind of seaweed for this purpose yields eight pounds of iodine per ton. Among the by-products are potash salts.

Petroleum Asphalt.

One of the most important questions before the people to day is that of durable highways. The automobile has brought with it a demand for better roads, but it has also shown that the macadam road is unable to withstand the disintegrating action of motors. The surface is loosened, and the action of the rear wheels causes the lifting and scattering of particles of stone, which results in the rapid deterioration of the road. The problem has arisen of finding some form of binder that would resist this action. Experiments have shown that asphalt oil offers one of the best means of preserving roadways. Oils have already been used for laying dust with good results, especially in California. Another kind of oil is used for the binder. The macadam road is constructed in the usual way, except that before the finishing coat of screenings goes on, this binder, with an asphaltic base, is applied hot at the rate of one and a third gallons to the square yard of surface. The screenings are then applied and the road rolled. The hot binder adheres to the stones, and under the action of the roller the screenings fill the voids and the road is consolidated. It has been found by experiment that automobiles have but little effect upon a road of this nature, and that a resilient, dustless surface results. There is little doubt that the next few years will witness great strides in new methods of road construction.

The Music of Electricity.

Transmission of sound, musical or other, from its generative center, has up to the present been accomplished on the principle of the telephone. In this, vibrations of a diaphragm cause certain electrical disturbances in an electro-magnet, and these transmitted to the magnet of the receiver cause like vibrations in another diaphragm, and the sound issues. Music has suffered greatly in such transmissions, especially since it has been necessary to use a microphone to intensify the sound. By means of a recent invention, musical tones may be sent from one instrument thousands of miles into thousands of receivers. The distinctive point of the discovery is not the transmission, but the generation of the tone. The musical sound results from no vibrating string or air vibrating pipe, but directly from the vibrations of an electric alternator.

In operating the invention, the performer plays upon a piano keyboard. The keys of this operate switches, so as to bring the several alternators into action on the lines or mains as required. Across these mains receiving telephones are connected, just as incandescent lamps are in the Edison lighting system. With each receiving telephone a large paper horn is used. The net result of the system is that instead of the feeble vibrations of the air acting upon a microphone, and then on the receiving telephone, the performer is enabled to bring to bear upon the line the full power of a large alternator. In no respect, it is said, is the electrical music like that from a mechanical piano. The vibrations in the first instance are purely electrical, and it is not until the electrical disturbance reaches the telephone receiver that the sound is produced. Combinations may be made to imitate several instruments or voices sounding together.

New Insulating Material.

A product of coal tar which has many valuable characteristics for insulation, bears the jaw-breaking name of oxybenzyl-methylengly-colanhydride. The public will be relieved to learn that for general purposes, the new material will be known as bakelite. It possesses some of the combined properties of hard rubber, celluloid and amber, being harder and stronger than the two first, although it does not have their flexibility. On the other hand, it withstands heat and is not attacked by solvents, and has the additional advantage of being much less costly. It is totally infusible and insoluble, and does not soften even at such temperatures at 350° C. At the degree of heat which melts glass, it chars without entering into fusion. It can be obtained either transparent or opaque. It can be mixed with filling materials, such as clay, asbestos, wood pulp and the like. It is said that generators and motors can be impregnated with the raw material, and by the simple process of heating under pressure, synthesis of bakelite will take place in or around the fibers which cover the wires of the coils. the whole therefore being transformed into a hard, infusible, insulated mass.

Bakelite has been employed for molded insulators, which possessed great mechanical strength, high insulating power and the ability to withstand high temperatures. Cheap soft wood, impregnated with bakelite, becomes as hard as ebony, is rot proof and a good insulator. A coating of bakelite on wood gives a beautiful finish, which is not affected by boiling in water, in solvents or in chemical solutions.

Blue Gas.

A novel system of illumination is being introduced in Germany, based on so-called blue gas. This gas is delivered in liquid form, in such shape that it may be used in closed rooms in hanging burners giving from 50 to 1,000 candle power. To use the gas all that is necessary is to pour the liquid from the steel cylinders in which it is delivered, into the gasometer. This is almost convenient as having one's own gas plant, says the *Mining and Engineering Journal*, for one can protect himself against accidents at the factory or delays in transit by always having on hand several full cylinders. A cylinder contains 22 pounds of gas, and costs less than $3. This quantity will supply a 50 candle power burner for 480 hours, so that this illuminant appears to be cheaper than petroleum. Blue gas can, of course, be used for heating and cooking as well as for forging, hardening and tempering and other industrial processes. It is a hydrocarbon compound, free from carbon monoxide, and is not poisonous: its heating effect is more than three times that of ordinary coal gas. Almost any apparatus that is arranged to burn ordinary coal gas or acetylene gas can be altered without much difficulty to burn this: and in such cases all that is necessary is to make the connection between the cylinder and the house pipes through a reducing valve. The explosibility of acetylene gas has a range of 47 per cent, and that of ordinary coal gas 13 per cent, while that of blue gas is only 4 per cent.

To keep themselves posted in the progress of the arts in which they are interested, inventors and manufacturers should subscribe for the INVENTIVE AGE, which publishes a list of all patents issued each month. The low subscription price and the character of the publication, entitle it to the support of all the inventors of the country.

Veil Machinery.

The eternal feminine will welcome the news that a machine has at last been perfected which will spot veilings with chenille, the result of course being a diminution in the cost of manufacture. Hitherto this process has been done by hand, and the machine does in a few minutes what would require months of labor by the old method. According to the description of our consul at Nottingham, a number of lengths of chenille are placed in a frame over the new machine, and pass down into it, being automatically inserted and cut as the veiling moves through. The machine is adjustable so that the spots may be in rows of absolute uniformity, or in varying rows.

The initial difficulty, which took years of experiment to overcome, was that many of the spots fell off the veiling, though apparently set in by the machine. Another serious trouble was the breaking of the net by the insertion of the chenille. These drawbacks were finally overcome, and the delicate working of the machine has been brought to a perfection like that of a steam hammer, whose momentum may be graded from a force sufficient to crush hard metal, to a blow so slight as scarcely to dull the point of a pin.

The production of the apparatus is stated to be nearly 200,000 spots an hour. As the machines may be widened almost indefinitely, they may be used for other purposes. It is possible that the entire industry of spotting fabrics of every kind will be affected. Strong chenille for thick substances could be made, as for curtains, tablecloths, etc., and the machine may also take an important place in the lace-making industry.

Life Saving Apparatus.

An interesting exhibit at the show of inventions held in Berlin last year was a device for saving life in case of fire. It is a self-rescuing outfit, intended for the use of individuals, but may also be a valuable addition to the general equipment of fire brigades. The apparatus comprises a drum, on which a steel wire cable has been wound. A direct connection between the drum, with a self-locking worm and a screw and a crank, through a convenient gearing, serves to operate and to brake the apparatus with absolute safety. The cable is flat and consists of about 90 steel wire strands, permitting a smooth and safe unwinding, while the brake prevents any involuntary sliding. The apparatus is started by turning the crank. If a fire breaks out and there is no other way of escape, the cable end is wound off and the apparatus is firmly secured by its hook to a heavy piece of furniture. Both legs of the person desiring to descend are introduced into a seating belt, and the upper part of the body is enveloped with straps, so arranged that the crank is placed in front of the breast. After issuing from the window and firmly setting the legs against the wall, the person slowly lets himself down by turning the crank, and descends to safety.

The apparatus is of very small weight and when traveling is carried in a leather case like a pair of ordinary field glasses.

A CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE. This keeps inventors and manufacturers posted in the art in which they are most interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy; twenty copies $1.50.—Please give correct data in ordering.—Address,

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Relay.....J.F. Webb, Jr.
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Rolling-mill.....L. R. Custer
Roof or train-sheds and other buildings.....H. J. Schlacks
Rotary engine.....J. F. Studholme
Rotary motor.....J. Ripberger
Rotary rack.....F. J. Panzer
Rotary tools, Support and driving mechanism for..E. G. Buchmann
Rubber-stamp device.....H. Schmidt and J. Heissenberger
Sad-iron.....D. Brightbill
Sad-iron support.....F. Kuhn
Sad-iron waxer.....L. Will
Sash-lock.....L. H. Grau
Sash lock, Automatic window-.....C. E. Poteet
Sash, Window.....H. L. Sipe
Sash, Window.....M. Gabriel
Scale, Mail-weighing.....T. F. Emans
Scoop-board.....W. H. Grizel
Screen frame, Metal-and-wood window.....F. E. Schoenberg
Screw-coupling.....G. Schuhmann
Screw-lock.....E. Muller
Selective mechanism.....L. B. Spencer
Separating-machines, Automatic wind-regulator for.....T. W. McBride
Separator-bowl liner, Cream-.....E. R. Bailey and M. A. Ganiard
Serving-cup for beverages.....T. J. Clement
Sewer and drain-tile outlet protector.....O. A. and J. A. Tenold
Sewers, Means of cleaning.....A. F. Cerruti
Sewing-machine.....L. Bulasky
Shade-bracket and curtain-pole support, Combined.....N. Provencher
Sheet and shelter-tent, Combined bed-.F. Whitney
Sheet-feeding apparatus.....A. B. Dick
Sheet-metal container.....H. A. Keiner
Shell extractor, Broken-.....O. H. Whitman
Shelving, Metallic.....G. H. Hurteau
Shoe-machine guide.....E. Lapointe
Shoe-shining stands, Foot-rest for.....G. F. Oliver and R. Rousseau
Shoe, Spring-heel.....J. C. Ivory
Show-rack.....W. H. Hall
Shutter-bower.....L. J. Gardner
Shutter-operaing device.....R. D. Merrill
Sifting apparatus.....E. A. Reed
Sifting-screen, Revolving.....E. E. Hanna
Signal.....H. C. Keays
Signal device.....C. M. Hartwell
Signaling system, Wireless.....V. Poulsen
Siphon.....C. F. Plunkett
Siphon, Automatic.....H. Buchler
Skirt.....W. Padernacht
Skirt and the like attachment.....W. Padernacht
Slag, Treating.....S. B. Ladd
Slipper or muzzle for drawing-on machine sfordrawing roll-covers..F. M. Morton and W. H. Dismuke
Smoke-consuming furnace.....A. Gropengieszer
Snow-plow and groove-cutter.....S. D. Murphy
Soldering-tool.....J. L. and O. G. Nilsson
Sound-reproducing machines .Feeding device and brake for.....F. Sheppy
Sound-waves, Device for transmitting.....R. Nirenberg
Spinning or twisting machine thread-guide.....J. E. Prest
Spraying apparatus.....F. Swearing
Spring-bending machine.....R. E. Johnson
Spring drill or brace, Reaction.....A. McGregor
Spring-wheel.....C. L. Driefer
Spring-wheel.....W. Eckert
Springwork.....W. Shannon
Sprinkler alarm device.....E. L. Thompson
Spur, Riding.....A. Muth
Square, Carpenter's.....A. Linder
Stamp-mill.....J. P. Rinker
Steam-generator.....J. G. A. Donneley
Steering mechanism.....L. Gabetti
Sterilizer, Utensil-.....G. Holden
Storage battery.....R. N. Chamberlain
Stove regulator, Gas-.....C. H. Herr
Stovepipe-joints, Package of nested or knockdown.....R. A. Metzger
Street-sweeper.....F. D. Rappelee
Sugar or candy or other substances of a similar plastic nature, Apparatus for pulling..E. W. Barratt
Swing-post and releasing-iron...A. E. Rosenberger
Swinging chair.....W. Gerlach
Switch-operating apparatus.....A. Vaitauer
Switch-rod adjustment. P. B. Blish and C. M. Bruff
Swivel.....J. S. Augustine
Tags, Seal-lock fastener for.....E. W. Workley
Talking-machine.....F. Shaffer
Telegraph system, Wireless-.....C. R. Underhill
Telegraph, Transmitter for automatic..C. L. Krum
Telegraphs and the like, Transmitter for electric..C. L. Krum
Telephone attachment.....H. F. Hansell, Jr.
Telephone attachment.....B. E. Detrick
Telephone-cabinet.....A. Larsson
Telephone coin-box.....F. D. Powell
Telephone-stand.....C. R. Schafer
Tennis-court marker.....A. Johnson
Thermostat.....W. Enterline
Threshing-rigs and other purposes, Coupling for...T. E.Stoa
Time-recorder.....J. F. Kiely
Time-recording apparatus, Intermittently-operated.....A. P. A. J. Plasschaert
Tire.....S. S. Childs
Tire.....G. H .Gillette
Tire.....G. E. Miller and C. M. Wheaton
Tire-fluid container.....C. E. Singleton
Tire, Pneumatic.....P. I. Vie
Tire setter, Rubber-.....C. A. Maynard
Tire-shield.....J. H. Fletcher
Tire shield, Pneumatic-.....F. W. Kruger
Tire-tread.....J. R. Sanford and J. G. Doughty
Tire valve, Pneumatic-.....E. Dubied
Tires, Cover for pneumatic and like.....H. W. Cave-Brown-Cave
Tobacco-box, Sheet-metal.....F. Eberhart
Tobacco extract, Manufacture of concentrated....C. F Gloystein
Tool, Fluid-operated.....C. B. Richards
Tool holder or chuck.....A. McGregor
Toy.....F. E. Lyon
Toy, Windmill.....G. Masulla
Transom-pivot.....J. H. Gilman
Traveling cutter, Endless.....W. V. Hadley
Trimming mechanism.....J. H. Michener, Jr.
Truck, Car-.....C. B. Goodspeed
Truck, Railway motor-car.....C. H. Howard
Type-writer line-space indicator.....C. C. Poole
Type-writer paper-movement indicator. C. C. Poole
Type-writer ribbon mechanism.....F. Sholes
Type-writing machine.....H. G. Davis
Type-writing machine.....W. F. Helmond
Type-writing machine.....E. F. Kunath
Type-writing machine.....H. Crutchley
Type-writing machine.....H. S. McCormack
Type-writing machine.....G. F. Ballou
Type-writing machine.....H. H. Steele
Typewriting machine.....J. C. McLaughlin
Type-writing-machine- line-spacing mechanism...J. W. Kennedy
Umbrella.....T. W. Black and J. James
Umbrella, Foldable.....J. W. Babbit
Umbrella, Folding.....J. Rose
Umbrella-frame.....J. Rose

Updraft-furnace....O. D. Orvis
Valve....J. P. Lavigne
Valve device....J. McGillivray
Valve device....A. A. Cryer
Valve device, Brake-....W. V. Turner
Valve, Fluid-pressure....J. M. Sissons
Valve, Split T....R. J. Harding
Valve, Three-way....C. E. Anderson
Valves, Hydraulic regulator for....V. Gelpke and P. Kugel
Valves, Means for grinding triple....E. E. Innis
Vaporizer....Z. G. Sholes
Vehicle, Dumping-....P. Brand and C. G. Glasrud
Vehicle reach attachment....J. Rodgers
Vehicle rein-holder....W. W. Hills
Vehicle storm-front....G. W. Scott
Vehicle-top-shifting rail....A. J. Murray
Vehicle-wheel....W. L. Howard
Vending apparatus or the like, Feeding device for....O. Oehring
Vending Machine....A. S. Killinger
Vending-machine....B. M. Davis
Vending machine, Card-....F. W. Calsow
Wagon-stake socket....H. W. Leverentz
Wall pocket and rack....C. B. Yoxheimer
Washing-machine....J. H. Knoll
Water-closet flushing-valve....C. H. Phillips
Water heater and purifier....A. W. Frederickson
Water-wheels, Deflector-hood control for tangential....R. M. Doble and A. Rosenthal
Weaner, Calf-....H. Beck
Well-strainer....A. M. Brown and F. Hunter
Wheel....L. J. Goodspeed
Wheel....F. R. Mather
Window....N. Plouff
Window-chair....J. M. J. Skelly
Window....N. Plouff
Wire clamp or support....O. F. Scholz
Window-cleaner....I. L. Clift
Window-pane fastener....S. J. Drago
Wrapping up tin cans or other articles, Means for....J. A. Horne
Wrench....J. L. Garner
Wrench....R. A. Ferguson
Wrench....M. L. Senter
Yoke center, Neck-....H. M. F. Leighty
Yoke hook, Neck-....L. M. Snyder

DESIGNS.

Automobile-horn....J. W. Jones
Badge....J. E. Curtis
Carpet....W. A. Elliot
Display-case....C. W. Cohn
Hat-trimming....C. E. Bright
Lamp-shade....R. D. Gould
Medallion or similar article....A. B. Tebbs
Pocket-book holder....J. Babzt
Reflector or similar article, Shade-....O. A. Mygatt
Shade, Artificial-light....K. Booth
Table....E. C. R. Ellsworth
Toy....F. J. Rosenberg
Vehicle-body....E. H. Remde
Wail-covering....K. L. Prinz
Water-tank....R. E. Crane

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MECHANICAL PATENTS.

Air-governor, Automatic....L. W. Baker
Amalgamator....R. Luckenbach
Ammonia-gas from ammonia liquors, Obtaining purified....C. M. Stine
Amusement apparatus....L. Collis
Anchor-hook, guy-clamp, and stretcher....G. F. Swortfiger
Animal fat product and making the same....J. H. Filbert
Annunciator-drop....B. W. Sweet
Antirattling device....J. J. Halladay
Arch, Fire-brick....E. P. Stevens
Atomizer for paint or the like....R. Reich
Automatic switch and signal....H. F. Roach
Automobile-lever lock....D. N. Nester
Automobiles, Gear-changing mechanism for....F. Beemer
Axle coupling, Reversible car-....M. Markarian
Back-pedaling coaster-brake....F. S. Ellett
Bale-identifying means....W. L. McCarty
Baling-press, Automatic....R. E. Rahm
Barrels, Manufacturing....O. Schubert
Bat-making machine....D. Haynes
Bearing....W. P. Rodman
Bearing, Antifriction-....H. Hess
Bed or box couch....H. J. Jacobs
Bed-spring, Adjustable....S. R. Hunt, Jr.
Bell, Selective-ringing magneto-....B. W. Sweet
Belt for transmitting power....C. F. Gray
Billiard-cue cutter....G. L. Lyman
Binder....J. D. Stow
Bolster....F. H. Davol, Jr.
Bolt anchor, Expansion-....H. W. Pleister
Book-forming mechanism....J. Bengough
Bottle....E. F. Berg
Bottle-capping machine....H. S. Brewington
Bottle holder, Milk-....V. C. Getty
Box-lid holder....C. W. Ufford
Bracket Device....H. S. Mills
Brake....R. E. Rudolph
Brake-lever....J. and W. Connell
Brickmaking-machine....O. G. Diefendorf
Bromisovaleric ester of the borneols....M. Dohrn
Brush....C. R. Uhlmann
Brush, Dustless....F. S. Hunt
Brush, Electric needle-spray bath-....H. Hertzberg
Brushes, Mounting for bottle-washing....A. N. Davis
Buckle, Harness-....J. E. Rempel
Buggy-top raising and lowering attachment....W. P. Warren
Bung, Faucet-....F. Fink
Butter-making machine....R. Williams
Cabinet, Biscuit-....C. A. Salzman
Cabinet, Panel-board....F. B. Adam
Calculating-machine....A. Monachimoff
Camera....F. A. Anthony
Camera-back....T. W. Ingersoll
Camphor, Making....C. Glaser
Candy-machine....J. Smith
Car-body head-frame, Railway-....C. M. Evans
Car-brace....W. I. Taylor
Car-coupling....N. F. Resseguie
Car draw-bar mechanism....C. M. Evans
Car-fender....P. A. Faust
Car-frame....H. M. Pflager
Car-indicator....E. Schupp
Car, Street-....C. B. Price
Car-tank....C. N. Stevens
Cars, Cooling attachment for stock-....B. L. Stimmel
Cars from self-dumping mining-cages, Automatic device for releasing empty....F. Brasche and W. Doelz
Carbonating-machine equalizer....S. H. Bither
Carbonator....L. M. Keeler
Carton closing and sealing mechanism....W. S. Scales
Cartridge, Loaded....G. Meadows
Cask cleaning and pitching apparatus....P. Seifert
Caster....I. L. Leasure
Caster-retaining device....D. A. Maccuaig
Casting apparatus, Stereotype-....H. F. Bechman
Casting metal ingots....J. F. Monnot
Cement-cistern mold....N. Bronhard
Centering-mold....J. E. Moody
Chain conduit....G. Monrath and A. J. Mottlau
Chaplet....W. J. McCarroll
Chart-suspension device....C. S. Jenkins
Check device, Manifolding scales-....E. Z. Lewis
Chuck....A. P. Kern
Chuck....C. E. Brooks
Chuck, Sub-....C. E. Brooks
Churn....J. F. Torbett
Cigarette and tobacco box....C. Campus
Cigars, Lid-supporting display-box for....A. G. Jaeger
Circuit breaker....H. W. Cheney
Clamping or binding mechanism....W. J. Wright
Cleaning apparatus, Cleaner-head for vacuum....F. S. Blackall
Cleaning device....P. A. Bayless and A. C. Hein
Clock-case and calendar-holder, Sheet-metal....W. H. Hall
Closets and urinals, Nidus for aerobic bacteria applicable to....E. L. Short
Closure and spout, Non-explosive....W. H. McNutt
Clothes-marker....J. Weaver, Jr., and A. Martin
Clothes-pin....F. H. Perry
Clutch member....E. M. Cook
Coal-handling apparatus....A. C. Stewart
Coating machines, Article-holder for liquid-....R. A. Beasejour and G. Drubel
Coffee-pot....M. Davidson
Coin-wrapper....E. W. Jennings
Collar....H. S. Kennedy
Collar, Set-....I. W. Exley
Collar-stuffing machine, Horse-....J. C. Collett
Comb....E. O. Kohn
Combination-lock....R. E. Runkle
Combination-lock....J. J. Murphy
Combination or keyless lock....O. M. Farrand
Combustion-motor....G. Enrico
Commutator-brush....F. W. Garrett
Compartment-can....E. Eckart
Concentrating-table....H. D. McLeod
Concrete culverts, Method and apparatus for making....H. Neah
Concrete form, Permanent....M. D. Murray
Concrete girder-frames, Crossover for....E. N. and R. E. Spaulding
Concrete, mortar, and the like, Apparatus for making....L. M. Reed
Concrete or cementitious compounds, Making....L. M. Reed
Concrete or cementitious compounds, Apparatus for making....L. M. Reed
Concrete post, Reinforced-....J. H. Carpenter
Concrete-reinforcing frames and product thereof Manufacturing....P. E. and R. L. Bertin,
Concrete-wall mold, Reinforced-....G. W. Stevens
Cooker, Fireless....G. A. Marsh and H. H. Thompson
Cooking utensil....G. C. Port
Coop or crate, Folding....A. Farmer
Core-drill....M. J. McLoughlin
Corn cutter and crusher....J. S. Bloom
Corn-sheller....G. Wandscheer
Corrugating-machine....E. R. Stasch
Corset....G. Pfeil
Corset....C. E. Woodworth
Corset-stay stiffener....H. M. McCormick
Cotton-chopper....P. Joiner
Coupling....H. A. Dulinsky
Coupling-ring for corrugated culverts....G. W. Storms
Cover-releasing means....C. G. Miner
Cradle....C. L. Finch
Crate....J. I. McClung
Crate, Folding....G. W. M. Smith
Crate or box, Collapsible....J. S. Strassel
Crib....O. F. Seifert
Cuff, Thumb-....H. E. Wood
Culinary utensil....J. H. Collins
Cultivator....R. S. Wells
Cultivator....D. J. Ellis
Curtain-fixture....P. Drinkaus, Sr
Curtain-rod....J. N. Henry
Curtain-stretcher....H. E. Southworth
Dam, High-service....R. Griswold
Damper-actuator....J. W. Barton
Dead-centers, Device for overcoming....L. F. Dahl
Dental engine....O. H. and A. F Pieper
Disinfecting composition....A. W. Lyda, W. W. Cubbison and F. C. Robinson
Display-rack....H. J. Schlegel
Display-rack....J. E. Taylor
Displaying lace, Cabinet for....W. J. Snyder
Distillation, Treating wood during....H. W. Doughty
Ditching-machine....C. J. Van Buren and L. A. Krupp
Door....J. P. Sjoberg
Door-fender....W. H. Terrell
Doors, Antisagging device for....C. Lehman
Dough-raiser....S. Rasmussen
Draft-rigging, Bumper-beam....E. C. Washburn
Drain of similar pipe....E. Harpham
Drilling apparatus....Wm F. Bossert
Dumping device, Automatic skip or bucket....T. O. Werner
Dynamite-heater....A. H. Vannauker
Dynamite, Machine for packing gelatin....T. W. Bacchus
Dynamo-regulator....S. D. Field
Dynamometer....E. E. Sweet
Easel for desk-calendars, cards, and other articles....W. H. Hall
Eaves gutter or trough....R. P. Mills and C. A. Taylor
Egg-washer....T. Thompson
Electric arcs, Production of long stable....O. Schonherr and J. Hessberger
Electric heater....C. E. Trewhella and E. D. Holley
Electric-machine brush-holder, Dynamo-....F. W. Garrett
Electric-machines, Brush-holder for dynamo....J. W. Webster
Electrical conductors, Current-leak indicator for....R. S. Masson
Electrical energy, System of distributing....P. H. Thomas
Electrical instrument for pyrogravure and surgical purposes....L. Mandarelli
Electrical measuring instrument....D. C. Jackson
Electromagnetic apparatus for actuating mechanisms....S. H. Hoggson
Electromagnet....D. J. Hauss
Elevator....A. C. Newton
Elevator....E. C. Porter
Elevator automatic stopping and locking device....J. P. O'Donnell
Engine....L. W. Noyes
Engine-starting jack....G. A. Bull
Engraving machine....V. L. Ourdan
Expander and flanger, F. Pfluger and E. Christensen
Eyeglasses, Mounting for....C. L. Merry
Feed-water into steam-boilers, Means for introducing....C. W. Seddon
Ferrule, Husking-....A. S. Lyddon
Fertilizer-distributer....E. C. Smith
Fiber, Soaking sheet....I. W. Marshal
Filter....A. Endler
Fire-escape apparatus....J. C. F. Sprankle
Fire-extinguisher....J. O. Banning
Fire-extinguishing apparatus....J. O. Banning
Firearm....J. Maudry
Firearms, etc., Safety device for....P. Mauser
Fireproof structure....C. W. Denny
Fish-hook....J. L. Chesser
Fishing-reel....A. F. Meisselbach and P. Catucci
Flour, Obtaining starch and gluten from wheat-....F. A. V. Klopfer
Fluid-distributing system....D. M. Hosford
Fluids, Rate-regulating device for....F. N. Connet
Flushing mechanism....P. H. McNeill
Fly-screen, Exit....W. Bagwell
Fruit and lard press. F. M. Becker and E. J. Ondrizek
Fruit and vegetable mill....J. Koerner
Fruit-picker....R. P. Andersen
Funnel....L. E. Edmunds
Furnace....W. M. Fage
Furnace water-back....T. Thornburg
Gage and measuring instrument....J. R. Cee
Game apparatus....B. P. Hanft
Game apparatus, Base-ball-....I. E. Eberman
Game-board....W. Brown
Garment, Combination body-....C. H. Osborn
Garment-retainer....M. J. Lambrix
Gas-generator....G. Poe
Gases by electricity, Apparatus for treating....I. Moscicki
Gasket and its manufacture....W. A. Lorenz
Gaskets Manufacture of....W. A. Lorenz
Gate....J. P. Dahlen
Gear, Reversing-....R. N. Smith
Gear-wheel....N. C. Naylor
Gearing and reversing mechanism therefor, Differential....D. E. Ross
Gearing, Mounting for speed changing....W. M. Bradshaw
Globe, Geographical....C. A. Rehm
Glove....J. C. Lake
Go-cart....H. G. Traver
Governor....N. C. Basset
Governor, Pressure-....S. A. Worcestet
Grader or a ditching-machine....W. L. Davis
Grading-machine....C. Skidmore
Grate, Knockdown mounted dumping-....C. F Selter
Grinding and pulverizing mill....J. J. Knight
Grinding, mixing, and sifting machine....W. H. Lish
Hair-dressing frame....J. P. Goin
Hammer, Electric power-....T. F. Pailey
Hammer, Explosion power-....R. S. Oberly
Handcuff....H. E. Wood
Handcuff-lock....H. E. Wood
Harness clamp and guide....G. M. Henry
Harrow....C. A. McCarthy
Harrow, Alfalfa-....L. F. Waterman
Harrow, Revolving....I. F. Waterman
Harrow, roller, and cutter, Combined rotary....J. H. Stewart and J. C. Heinickel
Harvester, Beet-....J. D. De Celle
Hasp-fastener and handle-bearing, Combined....F. Meyer and W. H. Caldbeck
Hat....F. P. Mate
Hat-brims, Apparatus for softening....R. E. Heim
Hat-brims Shaping and setting....C. F. Sackett
Hat-fabric-reducing machine, Felt-....E. L. Wales
Hat-pin....F. S. Buckminster
Hat rack and lock....A. D. Hill
Hay-loader....J. D. Baker
Hay-rake....C. Pearson
Headers, Feed for....J. D. Stow
Heater....F. R. Dye
Heater....R. F. Heim
Heating system....J. L. Sparks and F. R. Fddins
Heating system, Vacuum steam-....J. I. Sparks
Heating system, Variable-volume....F. H. Gold
Heel-attaching device....H. E. Burnham
Hermetic closure....W. A. Lorenz
Hinge....C. Andersen
Hinge device for window-sashes....C. F. O'Connor
Hinge, Gate-....G. C. Mason
Hitching-post....C. A. Miller
Hobby-horse, Progressing....O. W. Badger
Hollow Bodies, Construction of....M. Woerner
Hoop-keeper....L. A. Brigel
Horse-detacher....A. Nakraschofsky and M. Leonhardt
Horseshoe....C. F. Hyatt and E. W. Messmer
Horseshoe-calk....J. O. Kvenvold
Horseshoe-nail clencher....G. B. Mershimer
Hydro-carbon burner....C. R. and J. R. Kittle
Ice-sawing machine....J. H. Fisch and J. C. Pabst
Ice-machines, Freezing cylinder for....D. L. Holden
Illuminating system....H. Siedentopf
Indicator....D. C. Evans and O. O. Patterson
Infant's high chair....H. Jaspersen
Inking device....R. W. Munk
Insulator....J. W. Ranson
Internal-combustion engine....J. J. Kulage
Internal-combustion engine....W. Purnell
Keyhole-stop....B. Hellman
Kiln....R. W. P. Horn
Kinetoscope....E. M. Wooden
Knitted fabric....W. H. Horn, Jr.
Knockdown box....I. F. Adam
Knuckle pivot-pins, Retainer for....R. P. Lamont
Ladder, Step-....H. B. Turner
Lamp....O. A. Arneson
Lamp-Burner....D. L. Carchester
Lamp-burner....E. B. Lilly
Lamp-burner, Incandescent-....L. Fellberg
Lamp, Car-inspector's....J. C. Cliver
Lamp for road-vehicles....C. Rogers and G. T. Parker
Lamp, Gasolene or vapor....O. A. Arneson
Lantern....J. Wise
Lard substitute, Improving the odor of....I. H. Filbert
Last....S. M. Hamblin
Latch mechanism....J. Shand
Latch-operating device....C. G. Peterson
Lath, Metal....F. A. Wilson
Lathe centering device....E. W. Knobelsdorf
Lathe-head....K. W. Rockenhauser and H. F. Fischer
Lavatory....O. S. Bond
Lead arsenate, Manufacture of....E. E. Luther and W. H. Volk
Lead, Making white....J. A. Erbslow
Leather-working machines, Work-support for....T. H. Marrinan
Legging....J. Staggs, L. P. Tucker, and V. A. Wood
Lens-holder....H. S. Mills
Letter, Sign-....H. W. Pabst
Light producer, Focusing-....J. M. Stafford
Liquid-dispensing cabinet, Automatic....E. Lavens
Liquid-indicator and leak-detector....J. Foley
Listing and bedding machine....T. J. King
Loader and unloader attachment....O. Grimwood
Loading and unloading device....F. Snipes
Lock....H. C. Waldecker
Locks, Key-stop for....W. T. Hartman
Locomotive-controlling mechanism....E. L. Ravenner
Locomotives, Trailer-truck for....W. F. Kresel, Jr.
Logging-engine....A. Dunbar
Loom harness mechanism....E. S. Stimpson
Loom-shuttle, Automatically-threading....A. W. Beardsell
Looms, Lease-controlled stop-motion for....J. M. Yuill
Lumber-dolly....A. G. Lott
Lunch-box, Canteen....A. A. Low
Mail-bag receiving and delivering apparatus....F. W. Starr
Mail catching and delivering apparatus....P. J. Haney and J. H. Mortimer
Mail collecting and delivering device....W. M. Corthell
Marking device....R. Cook
Match-box....A. C. Nelson and J., Jr.
Match-box....H. W. Mann
Match-lighter, Automatic....E. H. Meyer
Match-server....G. Pouthinon
Measuring acceleration, Apparatus for....J. E. Boyd
Mechanical movement, Alternating....A. P. Crell
Melting apparatus....W. M. Carr
Metal and producing the same, Clad....J. F. Monnot
Metal body and producing same, Compound....J. F. Monnot
Metal coated objects, Producing....J. F. Monnot
Metal-ripping tool....P. Jensen
Metal wheel....G. H. Barschow
Metallic hoop....W. Goldie
Metallic rail-tie and rail-fastening....A. R. Cline
Meter system, Service-....W. Reid
Milking-machine....J. H. Hoover
Millinery device....J. Popper
Miter-box....F. W. McLean
Mixing apparatus....W. Snyder
Mold....J. R. Haldeman
Mop-wringer, Folding....F. H. Jaeger
Motor....E. E. Yaxley
Mower, Lawn-....J. H. Auble
Mower, Lawn-....L. J. Ertl
Mower, Lawn-....J. H. Auble
Mowing-machine....E. F. Ewers
Muffler....A. S. Coles
Muffler cut-out and horn-valve, Combined....C. G. Hawley and E. K. Baker
Musical instrument, Self-playing....T. E. Dougherty
Musical instruments, Pneumatic coupler for automatic....W. H. Rees
Nitroglycerin, Compound for eliminating noxious fumes when exploding....E. P. Bettanin
Nose-glasses....B. J. Knapp
Nozzle....F. S. Seagrave
Nut-lock....E. R. Kern
Nut-lock....G. Bryar
Nut-lock....G. F. Kilmer
Nut-lock....M. J. Wygonik
Nut-lock....F. G. Brown
Nut-lock....W. R. Garner
Oil, Modified cotton-seed....J. H. Filbert
Oil-switch....H. W. Cheney
Oiler, Floor-....J. T. Hart
Oils, etc., Apparatus for storing, supplying, and utilizing mineral....J. F. Connell
Oils, Improving the odor of vegetable....J. H. Filbert
Ore-crushing machine....C. C. Lane
Ores, Reducing....F. M. Becket
Ore-roasting furnace....A. R. Wilfley
Organ, Pipe-....T. Etwell
Package-tie....J. W. Johnson
Packing, Metallic....J. M. Rhodes
Pail, Dinner-....A. M. Hunt
Pails, Machine for applying ears to....W. Spain
Pan-lifter....L. A. Pertram
Paper-dispersing cabinet, Toilet-....A. H. Scott
Paper-hanger's table or platform....J. F. Kearney
Paper receptacle, Waste-....A. A. Low
Pattern for letters and numerals....D. F. Luke
Paving-block....S. Butz
Paving, Manufacturing a mastic for....J. H. Amies
Peanut-roaster....R. O. Stutsman
Pegging-machine....S. M. Cutter
Pen, Fountain-....C. A. Eklund
Perambulator....D. R. Collier
Petroleum-burner for incandescent lights....E. Holy
Phonograph-machine....H. S. Mills
Photographic apparatus and dark room combined Portable....J. B. Willyerd
Photoplanograph....C. J. Ellis
Photoprinting, Device for timing....R. E. Scharz
Piano-playing mechanisms, Expression device for pneumatic....J. Wieser
Picture device, Moving-....W. Hendrick
Picture-exhibiting apparatus, Moving-....J. F. Lockwood
Picture films, Safety appliance for reeling moving....N. H. Brown
Picture hanging and removing device....S. E. G. Buchanan
Piling device, Sheet-....F. P. Sheldon
Piling, Sheet....H. M. Gould
Pillow or cushion frame....M. A. Yenner
Pipe-bracket....C. A. Sibrel
Pipe connection and support....E. Boerme
Pipe-coupling....P. A. Johnson
Pipe coupling, Automatic train-....I. C. Cary
Pipe-fitting, Universal....W. H. Fynon
Pipe-joint, Flexible....W. A. Greenlaw
Pipe-joint, Fluid-tight rotary....A. Walder
Pipe-wrench....W. T. Bennett
Pitching-machine....J. Penningh and H. Kleiner
Plane....C. F. Mitchell and E. A. Schade
Planes and other tools, Handle construction for....C. R. Stanley
Planter....J. H. McCoy
Planter, Corn-....F. F. Towle
Plastic material, Machine for forming....W. T. Price
Plastic product....L. Desvaux and H. Allaire
Plate, Hot-....W. E. Jordan
Platens, Work-holder for flat....G. W. Donning
Plow attachment....C. Christianson
Pneumatic-despatch-tube systems, Automatic cut-off for....F. H. Welever

Plow, Wheeled....L. E. Waterman
Pneumatic feeder....E. M. Bassler
Post-card....J. M. Walcutt
Post-molding machine....C. O. Wiley
Postal card....L. Hohn
Potato-masher....J. E. Gloekler and A. B. Stahl
Prepayment-machine....W. M. Bradshaw
Press....F. E. Self
Printer's perforating-rule attachment....S. Palmer
Printing mechanism....F. G. Jahn
Printing medium....P. Charles and S. Faujat
Printing-presses, Ink-supplying apparatus for....H. D. Washburn.
Propeller....E. D. Parrott
Pruning implement....G. F. Jenkins
Pump, Dispensing-....A. Shields
Pump, Fuel....N. McCarty
Pump, Vacuum-....J. J. Sparks and E. R. Eddins
Punch, Ticket-....F. Angerstein
Pyrazolone derivative and salts thereof. E.Scheitlin
Rail....G. Flessa
Rail-clamp....G. G. Floyd
Rail-fastening....J. T. Ninnis
Rail-fastening, Metallic....H. Staadt
Rail-joint....B. Blampied
Rail-joint, Welded....C. F. Gailor
Railway-crossing....F. Washam
Railway, Pleasure-....C. H. McGiehan
Railway signal-fusee....F. Dutcher
Railway, Sliding....C. Theryc
Railway switches and crossing-frogs and the like Foot-guard for....F. W. Rizer
Railway-tie....L. Stringer
Railway-tie....C. M. Sheeley
Railway-tie....A. R. Clarke
Railway-tie....M. T. Murphy
Railway-tie, Metallic....M. M. Mitman
Railway-track structure....H. F. Roach
Railway-traffic control, Exchanger in tablet systems of....W. Clark
Razor-blade holder, Safety-....J. D. Brown
Reamer, Expansion-....C. O. Schellenbach
Reel-clamp....H. G. Huffman
Refrigerating systems, Apparatus for separating oil from ammonia in....C. D. Bauer
Refrigerator....J. C. Kelly
Relay....J. Ericson
Revetment, Reinforced....J. H. Taylor
Ribbon-attaching device....A. S. Wheeler
Road-locking block....H. H. Dickson
Rock-breaker, Subaqueoua....B. H. Coffey
Rock-drill support, Adjustable....S. W. Brothers
Rod gripper, Polished-....E. M. Hibbard
Roundhouse system....C. W. Johnson
Rubber elastic force-cup....W. F. Schacht
Sad-iron heater and receptacle....F. W. Wantzel
Safe-doors, Operating mechanism for bolts of....W. E. Wilkinson
Safe, Window-....M. H. Shrenkeisen and J. W. Hellion
Safes, Boltwork for circular doors for....W. E. Wilkinson and G. L. Mummert
Safety device, Automatic....F. F. Bourdil
Sander for rolling-stock....W. H. Quin
Sash-balance....A. F. Wahlberg
Sash-holder....B. F. Thompson
Saw-guide....J. C. Rennie
Saw-handle....R. D. Bower
Saw-tooth holder....W. B. Sanders
Staffold-coupling stirrup....E. Whitney
Scissors....J. L. Bishop
Scraper-blades, Edge-turning tool for....A. L. Myers
Scraper, Road-....J. H. Osten
Screen frame, Window and door....A. H. Mix
Scrubbing-machine....O. H. Witt
Seal....J. C. Reister
Sealing apparatus, Vacuum....G. A. Beardsley and D. Wardell
Search-light mounting....E. C. Everett
Secondary electric battery or accumulator....W. Moseley
Sectional boiler....E. M. Bosley
Seed-corn rack....C. A Dewey
Separators, Centrifugal liner for....J. H. Ohlsson
Sewer-pipe machine, Glazed-cement-....J. Thomas
Sewing and gathering machine....J. R. Moffatt
Sewing-machine....C. F. Gray
Sewing machine, Book....J. R. Reynolds
Sewing-machine folding and guiding mechanism....C. McNeil
Sewing-machine, Over-eaming....L. Onderdonk
Sewing machine, Shoes....A. F. Preston
Shade and curtain fixture, Window....O. C. Patton
Shade-roller....E. H. Rose
Shade-roller frame....J. W. Brewer
Shaper....A. E. Robinson
Sharpener, Disk-roller....H. W. Ware
Sharpener, Sickle....O. A. Haubenreisser
Sharpening apparatus....D. P. O'Brien
Sharpening-machine, Disk....I. F. Adamson
Sharpening machine, Saw-....J. P. Hedstrom
Sheet-metal brake....V. Benedek
Sheet-metal can....A. L. Mahony
Sheet-metal culvert....E. E. Norquist
Sheet-metal-paneled structure....J. Brogden
Shelf-locking device....L. M. Stearns
Shell-loading machine....G. L. Riley
Shelving....F. E. Martin
Shoulder-brace, suspender and belt apparatus....J. E. Hart
Shower-bath, Portable....F. H. Schmitt
Shutter bower and fastener....H. Zimmerman
Shutters, Mechanism for operating rolling....L. G. Wilson
Shutters or curtains, Roller for flexible....A. Rush
Shutters, Wicket-door for rolling....L. G. Wilson
Sifter for stoves, Ash-....C. E. Devermann
Signal-cord hanger....F. J. Borer
Singeing-machine....T. Allsop and W. W. Sibson
Sink-strainer....J. F. Sullivan
Sintering-machine....A. B. Young
Skirt-lifting device....M. Becher
Skirt-marker....W. J. Barlow
Skirt-regulator....T. M. Quisenberry
Sled-brake....E. G. Doland
Slicing-machine....L. E. Arnold
Slitting-machine....J. R. Pulsifer
Snow-remover....J. W. Weismantel
Soldering-tool, Self-heating....J. Wise
Sole-pressing machine....H. A. Davenport
Sound-reproducing machine....M. Keen
Spark-arrester....H. Liechty
Speed-changing device....C. N. Payne
Speed-changing mechanism....R. Symmonds
Spoke-setter....A. R. Kunzmann
Spool-holder for ribbons and the like. J. Ruesing, Jr.
Stacker....J. J. Schrag
Stalk-cutter and plow, Combined....R. P. Peeples
Stanchion, Cattle-....M. F. George
Steam-engine....A. F. Hall
Steam-engine, Duplex....E. W. Conkell
Steam-generator....G. A. Sims
Stencils, Making....J. C. Udall
Sterilizing fluids....C. B. Bartley
Stitching-machines, Trimming attachment for....C. A. Bonney
Storage battery, Electric....B. Ford
Strainer-tube, Locked....W. H. McNutt
Street-indicator....A. P. Jordan
Stump-pulling machine....J. Ducrest
Street-sweeper....S. Conrath
Suit-case and valise, Combination....C. Billburg and S. Chandler
Supporter....H. Bierhoff
Surgical instrument....R. L. Combs
Swimming-suit....F. B. Maslen
Swingletree....C. V. Anthenat
Switch....H. F. Roach
Switch mechanism....F. F. Young
Switch-stand....H. F. Roach
Swivel, Hydraulic....H. G. Johnston
Syringe, Vaginal....F. A. Neveu
Table....H. J. Sharp
Table, chair, and ice-chest, Combined....M. J. Mullikin
Tabulator mechanism....G. C. Blickensderfer
Talking-machine....A. Keller
Talking-machines, Brake mechanism for....G. Buelna and A. E. Burson
Telegraph-machine....G. C. Read
Telephone extension-call....A. R. Marcotte
Telephone slug-holder....M. J. Stark, Jr.
Thawing-machine, Steam....E. R. Bennett and M. I. Ekern
Thill-coupling....H. E. Vosburgh
Thill-coupling....V. B. Henby and H. Fintel, Jr.
Thill-support....W. Judd
Thermostatic regulating device....W. H. Carrier and E. W. Comfort
Thread, Coating....E. D. C. Bayne and L. A. Subers
Thread-waxing device....F. L. Alley
Threshing-machine....P. H. Graber
Threshing-machines, Automatic self-guiding coupling for....L. A. Davis
Threshing or separating machine..H. W. Eisenhart
Timer....A. S. Krotz
Tin-transferring machine....F. P. Boninie
Tire-inflation mechanism....F. A. Deunert
Tire-tool....A. C. Webber
Tool, Combination-....C. E. Bonner
Tool, Detachable-jaw....C. L. Mueller
Top, Gyroscopic....M. L. Hawks
Torpedoes, Starting device for the compressed-air motors of self-propelled....A. E. Jones
Toy....J. C. Turner
Toy, Aerial....J. W. Foster
Track-sanding apparatus....C. P. White
Traverse-ring....F. L. Lathrop
Trolley-lines, Automatic cut-off for....R. Brown
Trolley-wheel....B. Crow
Trolley-wheel....E. E. Ecker
Truck, Car-....A. J. McCauley
Turbines, Governing means for elastic-fluid....C. W. Dake
Type-casting machines, Device for casting short quads in....J. Kukla
Type-writer....G. W. Donning
Type-writer locking device....G. W. Donning
Type-writer tabulating device....G. W. Donning
Type-writing and calculating machines, Variable-spacing mechanism for combines..C. F. Laganke
Type-writing machine....J. Felbel
Type-writing machine....J. J. Cooper
Type-writing machine....H. Crutchley
Type-writing machine....F. J. Tanner and E. F. Griffin
Type-writing machine....C Gabrielson
Vacuum-cleaner, Portable....C. F. Barrett
Valve....J. H. Blessing
Valve, Dry-pipe....G. I. Rockwood
Valve, Flushing-....C. Barr
Valve for steam-heating systems, Modulation-....E. W. Comfort and J. L. Fitts
Valve for steam-heating systems, Regulating-....J. L. Fitts
Valve, Globe-....J. Struben
Valve, Reducing-....J. O. Banning
Valve, Rotary....S. Yankauer
Valve, Water and air relief....J. G. Midgley
Valves in engine-cylinders, Means for mounting..L. G. Sabathe
Vault, Burial-....J. D. Fowler
Vehicle, Motor-....J. K. Sharpe, Jr., and C. N. Leonard
Vehicle-seat....E. H. Faile
Vehicle-wheel....J. C. Willmon
Vending-machine....J. Vierling
Vending-machine casing....B. M. Davis
Vending machine, Stamp-....J. Fritsche
Ventilating system....A. West
Ventilation system....M. G. Hubbard
Ventilator....M. G. Hubbard
Vessel, Double-walled....G. R. Paalen
Vessels, Hatch-fastener for....M. Mulholland
Wall-coating, Interior....W. B. Allen
Wall-tie....J. H. Coffman
Washing-machine....R. Twohig
Washtub or wringer stand....P. M. Wiebe
Water-bag and syringe, Combined..W. G. Williams
Water-closet bowl....A. Plantier
Water-elevator....J. L. O. King
Water-jet apparatus....E. Koerting
Watering device, Stock-....J. Roach
Wave and gravity motor....A. T. Ransom
Whip-socket, Locking....C. H. Frederick
Winding-engines; Controlling mechanism for....R. H. Nicholson
Window....O. J. Ramshaw
Window-cleaner....M. Keith
Window-cleaning device....S. Jones
Window operating and locking mechanism....E. P. Sperry
Window-screen....O. L. Schanbacher
Window-tent....W. E. Walsh
Wire-die safety appliance....J. H. Reece
Wire fabric, Machine for making....E. W. Cornell
Wireless communication....C. D. Babcock
Work-support....R. F. McFeely
Wrapping, twisting and polishing machine....W. J. Carey
Wrench....C. E. Somers
Yoke, Calf and sheep....G. J. Viehmeyer
Yoke-ring, Safety neck-....G. H. Folsom and A. Russell

DESIGNS.

Card case....A. Schickerling
Casket-trimming....W. E. Stevens
Garment-supporter....R. A. Moore
Glass vessel....T. G. Hawkes
Glass vessel or similar article....H. P. Sinclaire
Rug....A. Petzold
Tiling....A. W. Nilsson

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MECHANICAL PATENTS.

Acetylene burner....K. Thurnauer
Acid. Manufacturing sulfuric....W. Hallock
Acids, Making....J. L. Tufts
Advertising device....C. C. Bishop
Advertising device....D. J. Whitaker
Advertising device, Automatic....J. K. Hosaka
Agricultural implement....A. C. Nelson
Air and gas mixer....C. A. Forsberg
Air brake apparatus....L. L. Hosack, et al
Air heating and circulating system...C. H. Smith
Aluminous materials, Treating....A. C. Higgins
Amusement apparatus....C. A. Pressey
Anchor, Guy....O. H. Lewis
Anchor or anchor-post, Earth....J. L. Perry
Annealing-oven....A. Veghte
Anti-rail-spreader....J. L. Denson
Antiseptic card, ticket, and package delivering case....E. E. Russell
Apparel, Renovating....M. L. Weiss
Atomizer or burner for liquid fuel....H. Braby
Automatic flood-gate....J. A. Bolling
Automobile-chassis....R. M. Lloyd
Automobile muffler cut-out..C. G. G. Hawley et al
Automobile rebound checking device..F. Mesinger
Automobile steering wheel....J. B. Dumais
Automobiles, Chain-drive adjustment and casing for....L. S. Chadwick
Automobiles, Wind-sheet for....F. Parizek
Baby-chair, Collapsible and suspensible....T. W. Cleary
Bag-frame fastener....B. vom Eigen
Bales, Identification means for cotton..C. H. Ivers
Baling press....W. H. Stewart
Bank, Savings....H. C. Schmidt
Batteries, Currrent-testing device for electric....W. C. Hood
Beam-shaping press....N. H. Davis
Bearing, Ball....H. Hess
Bearing, Double-thrust ball....A. Hirth
Bearing for high speeds, Air....S. de Ferranti
Bearing for shafts rotating with great speed....C. A, and O. W. Hult
Bearings, Roller side....A. Stucki
Bed, Folding....K. Evans
Bed-spring....J. F. Dixon
Beds, Attachment for....J. N. Moody
Bedsteads, Third-rail and fifth-leg attachment for....F. F. Berry
Binder, Loose-leaf....J. L. McMillan
Blade-carrying elements, Covering for....F. Hodgkinson
Blind and screen, Window....W. R. Derr
Boiler....W. A. Berry
Boiler-cleaner....J. H. Clipperton
Bolster....J. Heimlicher
Bolt and nut lock....C. Zinow
Boot and shoe fly holder....J. J. Smith
Boot and shoe hanger....C. B. Robuck
Boots and shoes, Holder for the eyeleted edges of....C. N. Leonard
Boring-tool....F. Thomas
Bottle....T. J. Dunn
Bottle cap....J. H. Alston
Bottle-cleansing machine....F. Retzman
Box and writing-desk, Combined....E. P. Lynch
Brake-beam detector....C. H. Williams, Jr
Breast-dirll and valve grinder, Combined....J. R. Sandberg
Briddle-bit....N. W. Bennett
Brooder, Fireless....E. S. Adams
Broom-corn header....H. L. Tonkinson
Brush....H. W. Hascy
Brush....S. A. Ver Bryck
Brush-holder....N. C. Bassett
Brush-holder....L. H. Sparks
Brush-holding stud....T. L. and M. J. Kearney
Bugy-top attachment....T. A. Brethouwer
Buggy-top support....J. P. Cline
Building construction....A. M. Hilbig
Building construction....J. C. Pelton
Bulletin....J. P. Keegan
Bundle-loader....H. S. Battee
Burner....T. S. Leese
Butter-making process....W. W. Wygal et al
Butter-packer....M. G. Olson
Cabinet, Compositor's bracket....F. J, Walker
Cabinet, Ironing....J. W. Peterman
Can-cover-coating machine....L. C. Sharp
Can fusing and soldering machine for square, rectangular, or polygonal cans..reissue....J. M. Young et al
Can-locking device....T. Scott
Cans, Apparatus for the manufacture of sheet-metal....R. H. Peacock
Caps or disks, Mechanism for feeding....I. F. Warme
Car center and end sills, Reinforcing-plate for railway....F. Koch
Car-door hanger....C. L. Bundy
Car door operating mechanism....J. F, Streib
Car, Dump....S. Otis
Car, Dumping....G. P. Ball
Car-fender. Automatic....J. Q. Kellum
Car-loader, Automatic box....J. E. Jones
Car replacer....J. Lanius
Car-roof....W. P. Murphy
Car-stake....F. Shillin
Car switch, Automatic street....G. Flessa
Cars, Friction-buffer and head-block for railway....V. V. Moore
Cars, Steam-pipe coupling for....J, E. Brodie
Carburater....F. L. Vaughan et al
Carbureter....H. H. Boore
Carbureter and like device for mixing gas or vapor and air....P. B. W. Kershaw
Carbureter jacket or casing....M. W. Hanks
Card-record card....W. C. Martineau
Carriage....F. W. Zingsheim
Carriers, Mechanism for regulating the speed between traveling....B. Manischewitz
Carton, Collapsible....L. P. Prown
Casket, Collapsible....R. E. Hahn
Caster....J. Montgomery
Castings, Machine for removing cores from....F. M. Sharp
Cellulose substitute....G. Muller
Cement and making the same, Waterproof....J. F. Schoellkopf
Cement-applying machine....G. F. Dunn
Cement-block-making machine....H. and J. H. Besser
Cement-burning apparatus, Portland....3 pats....T. A. Edison
Cement-worker's tool....J. T, Harrop
Centrifugal apparatus for separating purposes....E. Jahn
Check-receiving and sales-indicating machine....J. F. Lynch
Check-selecting mechanism....C. H. Hamilton
Chemical-roaction furnace....J. L. Tufts
Churn....H. F. Dorsey
Cigarette-shells with tobacco, Machine for filling....L. Lindelof
Cigars, Ash-guard for....T. A. Tubbs
Circuit-controller, Thermostatic...W. H. Kirnan
Cleaning apparatus. Air-suction....A. H. Squier
Cleansing fluid or compound....H. Hutchins
Clip-securing mechanism....G. P. Skinner
Clock, Alarm....J. B. Connolly
Clock, Electric....R. D. Hickok
Clock-pendulum....L. S. Hazzard
Clothes-line....C. H. Hardin
Clothes-line reel....R. Kneisley
Clothes-line support....J. Siemsen
Clothes-pin....J. A. Zerbe
Clothes-pounder....E. R. Crooker
Clutch, Combined friction and jaw....C. S. Hook
Clutch or brake, Friction....A. P. Brush
Clutch-shifting mechanism for fertilizer-distributers, etc....S. Boda
Coal-cutting machine....L. Schutt
Coat....H. H. Stanford
Cock for steam-boilers, Gage....C. F. Waterman
Coin-actuated mechanism....M. L. Buck
Coin-deposit apparatus....C. F. Hess
Collapsible box....S. Freund
Collar fastener, Horse....H. A. Wolverton
Comb loss-preventing device....F. B. Salter
Composition of matter....S. A. Leavitt
Concentrating table....J. W. Meyers et al
Concrete-block-molding machine....F. M. Henry
Concrete casings, Fitting for....F. A. Koetitz
Concrete-mixer....J. W. Stuart
Concrete pipes, Apparatus for constructing....F. Teichman
Concrete-post machine....H. Durr
Conductor, Aerial....S. Eisenstein
Conductor, Armored....E. D. Speer
Construction member....J. C. Pelton
Control, Convertible system of pressure or vacuum....W. J. Richards
Conveyer-pipe....J. Hopkirk
Conveying and distributing mechanism..J. Simons
Cooker....J. B. Dodson
Cooker, Steam....J. A. Kleinfelder
Cooler and aerator....F. R. Noonan
Copper from a solution oi salt of copper, Obtaining pure metallic....2 pats....L. Jumau
Crates, Closure-fastener for bottle-shipping....C. W. Smith
Culinary utensil....A. F. Waddell
Cultivator....A, Brigden
Curling-iron, Electric....C. W. Wilmot
Current motor....C. A. Neyland
Current-rectifying apparatus, Alternating....C. P. Steinmetz
Cutter-head and bit....R. P. Birdwell
Cutting and punching machine....D. S. Stover
Cutting stool, Stone....A. Barbagelat
Decorticator....W. L. Weber
Dental tooth-regulating appliance....E. H. Angle
Die-press....C. P. Bascom
Display-boxes, Rack for holding....O. E. Bracht et al
Displaying advertisements, Appartus for....E. and W. Rhodes et al
Dividers, Proportion....L. M. Nelson
Door fastener....A. L. Cox
Door-hanger....J. G. B. Lamb
Door-lock....A. B. Lake
Drain conneetion....E. L. Dawes
Drain connection....E. L. Dawes et al
Dress-fitting stand and skirt-marker...C. Newman
Drier....T. M. Wilson
Drying apparatus....T. Howarth et hl
Drill....2 pats....H. R. Hughes
Drilling-machine....H. E. Temple et al
Drive mechanism....C. Jensen
Drum, Heating....D. D. Harr
Dynamometer, Transmission....T. R. Moore
Easel....D. A. Benjamin
Egg-beater....R. W. Edwards
Egg-carrier....J. Lunke
Egg-case....T. E. Perkins
Electric conductors, Extension plug or device for connecting....W. E. O'Neill
Elettric coupling....T. Maijgren
Electric generator....E. F. White
Electric heater....J. E. Macomber
Electric switch apparatus....A. F. Berry
Electric system, Receiving....C. Wirth et al
Electric time-controlled device....W. J. Lunger
Electrical oscillations, Receiver for high-frequency....E. H. Vreeland
Electrolyte....A. Van Winkle
Electrolyzing apparatus....E. L. Thorp
Elevator-clamp....S. P. Nunnink et al
Emery-wheel dresser....F. Curtin
End-gate fastener....A. F. Williams
End-gate for wagons....M. O. Parker
End-matcher....W. S. Sherman
Engine multiple-bar eonstruction, Refining....S. R. Wagg
Engine sparking mechanism, Gas....E. S. Bowen
Envelop for filing or carrying correspondence and the like....A. Bushnell, Jr
Explosion-engine....C. T. Brown
Extracts, Making....W. Wiegand
Eyeglass-fastener....G. F. Powell
Eyeglass-mounting....J. Spaar
Fan, Motor-driven....H. M. Shedd
Fan, Rotary....C. M. Spalding
Fastening....I. Coleman
Feed heater and trough, Combined...B. J. Butler
Fence-clamp....P. Green
Fence-post....E. A. Morrill
Fence-pcst....J. B. McMillian
Fence-post, telegraph-pole, etc....H. L. Stillman
Fence-stretching machine, Wire....R. O. Frazee
Fertilizer-distributer....W. T. Harkey
Filter....A. Rahe
Filter, Air....M. McGerry
Filter, Feed-water....R. C. Monteagle
Fire-alarm apparatus, Electric signaling....W. H. Kirnan
Fire-alarm signal apparatus....W. H. Kirnan
Fire-escape....D. Weinstock
Fire-escape....J. P. Smith
Fire-hose protection-nozzle....M. J. Sanger

Fire-kindler composition....R. M. Sheets
Firearm....J. Keith et al
Flat-iron heater....E. B. Pendergast
Floor and ceiling plate and making the same....C. B. Simmons
Flowers, Receptacle for....G. Purdue
Fluids, Apparatus for controlling the flow of....S. Cook
Flushing apparatus....A. D'Amario
Forceps, Pig....W. Robertson
Form-adjusting device....E. E. Winkley
Frogs, Anticreeping device for spring....G. W. Whiteman
Frogs, Cushioning device for loose rails of spring....G. W. Whiteman
Fuel....W. G. Bloss
Furnace....G. F. Rendall
Furnace front and door....T. Downie et al
Fuse, Safety....W. Menzel
Fuses, Adaptable terminal contact for safety....V. F. Morgan
Game apparatus....W. W. Slocum
Game device....R. Wohlmeyer
Garment-hanger....J. Nagely
Garment, Padded....C. H. Dean
Gas and water meter....A. G. Sutherland
Gas-burner....W. M. Bachelder et al
Gas-compressor....T. Shipley
Gas cooler and cleaner....E. H. Amet
Gas-generator....I. A. Chavanne
Gas-generator....N. Goodyear
Gas-heater....A. Abramson
Gas-meter and other coin-freed apparatus....J. MacKenzie et al
Gas-producer fuel feeder....J. and W. Stewart
Gas-producing furnace....P. G. Schmidt
Gas-purifier....T. A. Edison
Gas-regulator....F. E. Youngs
Gate....D. Riley, Jr
Gearing....J. W. Reams
Gearing for indexing mechanism....E. H. Browning
Glass-flattening tool....R. L. Frink
Grain-drier, Centrifugal....C. W. F. Steinmann
Grain-separators, Straw-rack for....J. P. Neste
Graining device....C. T. Ridgely
Greenhouse-roof construction....N. J. Rupp
Grinding-machine....C. Smith
Grinding-machine....F. Woodruff
Grinding-machine, Gearing for....D. Kelley
Grinding mill....R. D. Maio
Grinding routing-cutters, Cutter holder for....V. Royle
Grubber and cultivator, Combined grass....C. W. Stark
Gummed paper....C. H. Crowell
Gun-barrell and producing the same....R. H. Berkstresser
Guns. Single trigger mechanism for double-barrel shot....J. Lamer
Hair-dressing appliance....W. J. Moore
Hair-roll....L. E. Renth
Hame-clip....J. W. Dunfee
Hammer and puller, Folding tack....L. Herritt
Harrow, Disk....A. E. Fox et al
Harrow-teeth, Fastener for....W. A. Bennett
Harvester, Beet....J. Bennett
Hat and coat hanger....G. Manser
Hat hanger....E. F. Kandlbinder
Hat-holder for packing-receptacles....H. Seward
Hay and shock loader....T. E. and O. McDowell
Hay-carrier....F. B. Strickler
Hay-rack....M. Engesser
Hay-rake....H. A. Smith
Hay-rake....L. D. Lamkin
Heating-furnace, Seal for continuous....H. E. Smythe
Heel, boot or shoe....K. C. Rogers
Heel-indenting machine....F. H. Warren
Hoist, Skip....P. A. Orton
Horns, Boring....E. Etienne et al
Horse-checking device....F. J. Thomas
Horseshoe....T. J. Levy
Hydrant....L. M. Lancaster
Ice-cream-centaining cabinet and soda-fountain....2 pats....W. Buttler
Ice-cream freezer....B. A. Casmire
Inhaler....H. P. Collins
Insecticide....F. X. Lechner
Insulating compcsition....M. McGerry
Insulator....L. McCarthy
Insulator....M. Neubert et al
Insulator....C. M. Graham
Insulator house-fixture, Automatically adjusted strain....C. S. Burge
Insulator, Reinforced wooden support for....C. M. Graham
Internal-combustion engine....H. H. Low
Iron ore, Treating....J. T. Jones
Iron ores, Treating titaniferous....W. Borchers
Ironing-baards, Clothes-support for....R. D. Wolf
Irrigation-ditch outlet....W. H. Tucker
Jacket, Lady's....J. F. Goodenow
Jacket, Pneumatic life....P. B. Gaudet
Jacquard-cards, Machine for repeating....V. Royle
Journal bearings, Machine for grooving....F. Raymond
Kiln....A. E. Truesdell
Kitchen utensil....S. C. Arnold
Knitting-needles, Machine for making spring....J. Maitland
Labeling machine, Bottle....C. A. Fosselman
Lacing tool, Belt....J. W. Kane et al
Lamp, Electric glow....G. K. Hartung
Lamp extinguisher, Gas....J. Simmerman
Lamp filaments, Forming electric-incandescent....W. von Bolton et al
Lamp, Hydrocarbon incandescent....A. B. Young et al
Lamp, Incandescent gas....O. Wiederhold
Lamp, Vapor burner....R. W. Zierlein
Lnmp-working apparatus....W. F. Hutchinson
Lamp-working apparatus for vehicles....W. F. Hutchinson
Latch, Gate....L. P. Peden
Lathe-center....C. S. Totten
Lawn sprinkler....J. Keene
Lawn-trimmer....W. Louden
Lease-reeds, Apparatus for manufacturing....C. A. Geer
Leather-seasonin-machine attachment....F. F. Slocomb et al
Lenses, Making bifocal....aW. Bausch
Letter-box, House....V. C. Koons
Line-roller....F. Buerkle
Lighting systems, Generator for hydrocarbon....O. J. Seehausen
Linotype machine....J. R. Rogers
Liquid-conveyer....E. P. Fowler
Liquid-fuel burner....W. M. Simpson
Load-binder....W. Louden
Locker for hats, etc....G. Schwinn
Locomotive ash-pan....J. A. Kremser
Locomotive, Logging....H. N. Covell
Locomotive-lubricator....E. Blauhorn
Loom, Automatic weft-replenishing....E. S. Stimpson
Loom, Weft-replenishing....H. W. Smith
Looms, Change-gear for mechanical....F. L. Wachtler
Looms, Magazine for automatic weft-replenishing....W. S. Southwick
Lubricator....G. B. Essex
Magnetic detector....J. Murgas
Mail-bag catching and delivering apparatus....R. H. Hudson
Mail-box....F. C. Bates
Mail-chute....G. P. Burris
Match-igniting composition....L. Stange
Match telescoping holder....B. H. McDonald
Meat-chopper....H. C. Sander
Meat, Curing....J. C. Lincoln
Meat-cutter....F. Bartz
Meat-holder....C. G. Blair
Mercuric salts with hexamethylene-tetramin, Manufacturing soluble compounds of....A. Busch
Metal-bending machine....T. Kardong
Metal castings, Manufacture of....P. Bohin
Metal fabric, Expanded....N. E. Clark
Metal, Producing rods, tubes, wire, etc., direct from molten....A. H. Pehrson
Metal-sawing machine....C. A. Juengst
Metal strips in grooves, Securing....C. A. Parsons and E. C. Carnt
Microtome....W. L. Patterson
Middlings-purifier....L. A. Tator
Milk-cooler....T. E. Dickson
Milking-machines, Pulsator for....D. Brown
Miter-box....C. L. Nystrom
Mixing-machine....J. A. Svenson
Moistener for brooms and brushes....J. C. O'Donal
Molding appliance....W. H. Crum
Mop, Floor....J. S. Hoover
Motor-controlling device, Electric-....C. D. Knight
Motor-driven twisting element for spinning, doubling, and twisting machines....S. Z. de Ferranti
Motors, Operating multistage prime....P. G. Schmidt
Mower, Lawn....E. M. Stapleton
Mowing-machine, Swather for....S. A. D. Riley
Music-player action-valve, Automatic self-adjusting pneumatic....E. B. Hough
Musical instrument....F. X. Audet
Musical instruments, Registering and recording means for....B. S. Dean
Nozzle....M. Warren
Nurling-tool....A. W. Graham
Nut-cracker....H. M. Quackenbush
Nut-lock....W. M. Smith
Nut-lock....W. R. Garner
Obstetrical appliance....F. E. Kelly
Obstetrical pad....M. H. Topping
Oil-can and the like....T. J. Fitzpatrick
Oil-pan and candle-holder....T. Cohn
Open-welt guide....W. Gibson
Ores, Treating....P. L. T. Heroult
Ortho-dioxyphenylethanolmethylamin and making same....F. Stolz and F. Flaecher
Oscillating motor....W. V. Frank
Oyster-opener....P. Lekam
Packing for light-sensitive layer-carriers....J. Schmuck
Packing, Metallic....G. Huhn
Pail, Milking....F. H. Beach, Jr.
Pail-support....F. A. Wood
Paper-bag holder....J. J. McGettigan
Paper-feeding machine....F. W. Sprowles and J. C. Lorgion
Paper-trimming machine....H. F. Dunbar
Paper vessel....C. T. Bloomer
Parachute....T. L. Zook
Paraffining disks or the like, Machine for....W. L. Wright
Pasteurizing and cooling process....J. Willmann
Peanut-feeding mechanism....B. M. Dav
Pen....W. von Bolton
Phonograph....J. C. Nuernberg
Photographic prints, Compound for the treatment of....C. B. Waite
Photographing-machine....F. M. Holmes
Piano....F. Leola
Piling, Sheet-metal....N. E. Marsh
Pipe-coupling....H. D. Robinson
Pipe-coupling....W. McGrath and E. J. Buckbee
Pipe, Machine for cutting large....D. L. Holland
Pistol, Automatic....R. Wiles
Piston-connecting rod....J. B. Hicks
Planter....A. Brinkoeter
Planter, Potato....G. W. Nation
Planter-support....O. H. Omodt
Plastic composition....J. H. Mills
Plates, Apparatus for the manufacture of tin or like....S. C. Stiner and R. H. Kehring
Plow-blade....O. S. Jewett
Plows, Attachment for wheeled....H. Westmeyer
Pocket-knife....V. A. Johnson
Pole-tip....J. Poul
Porous material, Manufacturing a....H. Senn and D. Kluger
Power generating and distributing system....A. C. Eastwood
Powder grain, Smokeless....H. Maxim
Power-transmitter....M. K. Golden
Press....W. Kocke
Press-button, Adjustable....A. O. H. Hellwig
Print-washing machine....F. W. Emerson
Printing, Color....J. Rheinberg
Printing-press....S. B. Seaton and R. G. Travis
Printing press attachment....H. and C. Taxter
Projectiles, Banding....T. A. Kearney
Propeller and current-motor....J. G. Gracey
Propeller for vessels....O. Nielsen
Propelling ships and other water-vehicles, Mechanism for....L. Diehl
Pump....E. W. Christie
Pump....H. Cunning
Pump, Air....E. J. McCutchen
Pump, Deep-well....G. W. Price
Pump valve mechanism, Hot-water....C. Caille
Pump working-head, Power....P. A. Myers
Pumps, Working-head for power....P. A. Myers
Punching-machine....E. O. C. Kuhnel
Rack....A. S. Noonan
Rail-bonds, Manufacture of....G. A. Mead
Rail chair and brace....E. Jandreau
Rail-joint....J. Brown
Rail-joint....H. W. Lewis
Rail-tie and fastener....W. O. Timmons
Railway-rails, upgrade, Power-rigging for pushing....J. C. Brown
Railway-crossing....J. E. Reese
Railway-switch....C. S. Ruggles
Railway system, Surface-contact electric-....W. M. Brown
Railway-tie and rail-fastening....W. E. Johnson
Razor, Safety....J. L. Grimes
Receptacle....M. S. Weaver
Receptacle, Garbage....J. Conley
Refractory substances, Process relating to....R. Tripmacher
Refuse-burner, garbage and ash receptacle, Combined....W. M. Hooper
Register-hook....F. W. Weston
Registering and calculating machine, Expense....J. G. Ferguson, Jr.
Relay....J. M. Long
Relay transformer, Monotelephone....P. E. Heina
Retort-bench....D. R. Russell
Ring-traveler hoiding and delivering means....L. S. Burbank
Riveting-machine....J. R. French
Rock-drill, Percussive....W. C. Stephens
Rolling screen....C. Bauer
Roofing and producing it, Composition....W. A. Biles
Rotary internal-combustion motor....F. Kasparek
Rotary motor....J. W. Mooney
Sap-spout....P. S. Drake
Sash-balance....C. H. Craig
Sash-fastener....R. Henry
Sash hanger, Storm....H. P. Benton
Sash holder and lock, Combined....J. F. Beatty
Sash-lifter and ventilator....A. Rosenberg
Saw-blade lubricator....G. E. Haszinger and S. J. Ronan
Saw-set....R. P. Redifer
Seal-opener, Crown....J. D. Coughlin
Sealing and stamping machine, Envelop....J. A. Miller
Sealing and stamping machine, Envelop....C. F. Davis
Sealing preserving-jars and other purposes, Composition for....A. H. Kerr
Self-setting trap....W. W. McGarvey
Separator....S., Jr., D., and C. Franks
Sewed articles, Seam for....H. H. Fefel
Sewing machine....H. H. Fefel
Sewing-machine drawers, Spool-holder for....A. Stewart
Sewing-machine needle-thread take-up and controlling device....F. W. Merrick
Sewing machine, Shoe....F. J. Freese
Shade and curtain-pole bracket, Window....C. M. Tichenor and J. Shoup
Shade and curtain-pole support, Combined....A. Hudson
Shade-hanger....J. H. Ormsby
Shade-roller fixture, Window....A. McCanne
Shade-support, Adjustable....C. P. Westhauser
Shaft-coupling....C. Schmidt
Shaft lifting and supporting device, Automatic....J. D. Ellison
Sharpener, Mower-knife....A. M. Beecher
Sheet-metal vessels, Mechanism for seaming....J. E. Abrams
Shelf and sheet-metal brackets....A. Dahl
Shin-guard....C. H. Dean
Shock-absorber....P. M. Freer
Shock-absorber....G. E. Shippey
Shoe-polishing device....E. F. Stratton
Sign-board....A. B. Warfield
Signaling-means....Z. Wessel
Skirt and garment supporter....H. F. Tibbetts
Skirt and shirt-waist pin....S. E. Moore
Sled....W. L. C. Chambers
Sled, Bob....R. I. Cowden
Slitting mechanism....N. E. Clark
Smoke-consuming furnace....G. J. Slaline
Smoothing-iron, Electric....A. O. Whitmore
Snap-switch....J. H. Wyatt
Snow-shovel....J. Gifford
Sound-box for recording and reproducing machines....W. W. Zackey
Spark-plug....A. Clarke
Spark-plug indicator....A. C. Hall
Spinning .doubling, and the like, Apparatus for....S. Z. de Ferranti
Spoke-inserting machine, Automatic....J. W. Peplinski and C. F. Thayer
Spray-trough....F. F. Bentley
Spraying apparatus....H. F. B. Snyder
Spring-wheel....R. McFarland
Spur....J. W. Fields
Stand....W. B. Le Bourgeois
Stay-bolt....W. M. Smith
Stay-bolt, Flexible....W. M. Smith
Steam and analogous system, Low-pressure....B. R. Doody
Steam-generator....A. Wallerstein
Steam-trap....H. D. Singer and H. V. D. Pratt
Steamship or vessel, Twin....D. M. Pfautz
Stock-releasing device....A. W. Thompson
Stone-polishing wheel....S. H. Mills
Storage battery....R. N. Chamberlain
Stovepipe-fastener....J. L. Ellis
Submergible motor....A. C. Durdin, Jr.
Switch mechanism, G. W. Fisher and F. Hoyland, Jr.
Switch-stand....W. M. Brown
Switch-stand, Automatic....E. E. Staggs
Swivel-joint for speedometer-driving connections....J. K. Stewart
Table and ironing-board, Combined....R. H. Relinghaus
Table leg or support....M. McCann
Tables and chairs, Fastening device for legs of....J. Phelps
Tag, Key-ring....H. E. Milleson
Tank for gasolene, etc....A. A. Augustus
Teapot-cover....T. J. Clement
Telemotor apparatus....W. G. Gibbons
Telephone-exchange system....H. G. Webster
Telephone-repeater....M. R. Gilson
Telephone service, Apparatus and system for measuring....D. S. Hulfish
Telephone system....H. G. Webster
Templet....W. C. West
Tenpin-spotting machine....F. W. Coffin
Threading-machine....A. Emerson
Ticket-case....H. Stephan
Time-recorders, Registration regulation for....G. W. Phillips
Time-recording mechanism....J. and A. Dey
Tire-upsetting and wire-twisting machine, Automatic....J. W. Peplinski
Tires to wheels, Machine for attaching....H. L. Stoup
Tool, Combination....R. J. Kennedy
Tool, Combination....J. E. Nordlie
Tool, Combination....R. C. Kleffman
Toy....J. C. Turner
Toy....H. Barry
Toy, operated by static electricity, Puzzle....E. A. Sullivan
Track-gage....G. B. Perkins and J. S. Forbes
Transmission system....J. Schlig
Trap-fitting....J. M. McKerchey
Traverse-ring....T. D. Stone
Tray, S. J. Schlappich, C. R. Ward, and J. S. Sheridan
Treeing-machine....E. N. Chandler
Trephine....W. H. Hudson
Trip and signal device....G. A. Davis
Trolley-retriever....M. D. Self
Trolley-wheel holder....J. Barry
Trunk....S. W. Bonsall
Trunk....C. M. Howes
Tube-expander....G. Wiedeke, Sr.
Turbine blade and vane....G. Westinghouse
Turbine-blades, device for fixing....J. Dahl
Turbine-buckets, Forming U-shaped....H. Keller
Turbine-driven spinning, doubling, and twisting machine....S. Z. de Ferranti
Turbine, Elastic-fluid....G. Westinghouse
Turbine-engine....C. A. Sturtevant
Turbine, Marine....J. Wilkinson
Turbine nozzle control, Elastic-fluid-....G. Westinghouse
Turbine, Steam....J. Karrer
Turbine water-wheel....H. Broomell
Turn-table....C. M. Stanley
Type-writer attachment....F. E. Riegger
Type-writer cylinders, Attachment for....G. E. Pease
Type-writing machine....A. F. Smith
Type-writing machine....A. W. Steiger
Type-writing machine....H. H. Steele
Type-writing machine....A. W. Smith
Type-writing machine....D. Briggs
Type-writing machine....J. J. Cooper
Type-writing machine....W. F. Melmond
Universal-joint and four-wheel drive....A. H. Fetzer
Vacuum-jackets, Sealing....J. L. Fate
Vacuum-tubes, Automatic gas-feed for....D. M. Moore
Valve....F. A. Warter
Valve, Controller....J. M. Horridge
Valve, Emergancy....H. A. Dolley
Valve for heating systems, Vacuum....F. Shurtleff
Valve-grinder....F. I. Harding
Valve, Liquid....K. Kiefer
Valve mechanism....O. Bartel
Valve, Tank....V. F. Bernesser and J. J. Crotty
Valve, Triple....J. Dillander
Vapor-burner....E. O. Risse
Vaporizer for disinfectants....G. Leininger
Vehicle-brake....F. Gettelman
Vehicle connection....J. J. Wescott
Vehicle-wheel....Z. A. Curtis
Vehicle-wheel....W. E. Killen and E. C. Phillips
Vehicles, Portable track for motor....D. Roberts and C. James
Vehicles, Registering device for passenger-conveying....E. V. Jacka
Ventilators, transoms, and the like, Mechanism for operating....J. F. Beatty
Vine-cutter....L. R. Dean
Vise, Adjustable....F. A. Pfeifer
Vise, Blacksmith's....S. D. Ruth
Waist....M. H. Mergenthaler
Wardrobe, Portable....W. F. Eichelman
Washing-machine....T. McEachran
Washing-machine gearing....F. E. Thompson
Wave-motor....W. H. Daily
Weaner, Calf....L. Goetschel
Weighing-machine....C. J. McLeod
Weighing-machine, Automatic....W. E. Nickerson
Weighing-machine, Coin-controlled....C. J. McLeod
Wells, Apparatus for pulling oil....D. A. Keller
Wheelbarrow....W. Haslup
Whip-socket....J. Van Blarcom
Whip-socket, Locking....F. J. Erickson
Windmill....N. and J. Wagner
Windmill and clutch therefor....F. W. Pierson
Wire-fabric machine....W. F. Drexler, Jr.
Wire hanger for magazines, books, etc....J. C. Mick
Wire heddle....E. A. Hartz
Wire or cord tightener....E. W. Cokeley
Wire-stretching device....J. A. Kamp
Wrench....G. W. McElroy
Yarn-changers, Controller for....H. H. West

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MECHANICAL PATENTS.

Adding machine....C. W. Gooch
Addressing-machine....W. F. Kellett
Advertising device....M. H. Singer
Advertising-machine....F. W. Remer
Aerodart....C. R. Bannihr
Air-brake....W. V. Turner and C. C. Farmer
Air-brake system....E. M. Swift
Air motor or locomotive....J. I. Pittman and E. Harrison
Air-ship....R. Schmiechen
Amusement device....F. W. Nall
Annunciator-board....J. Zickel
Armatures for alternating-current motors, Winding of....B. C. Shipman
Atomizer....R. F. Venner and A. W. Brown
Automobile-lock....H. F. Crim and W. C. Loy
Automobile rear axle....F. C. Miller
Automobile wheel....J. A. Fleming
Awning....M. L. Bond
Axle-bearing device, Car....J. W. Stephenson
Axle-box lubricating device, Car....H. C. Gamage
Bag-bundling device....G. J. Neussen
Baker's goods, milk, postal packages, newspapers, and the like, Arrangement for receiving....W. Eichelkraut
Baking-powder....W. A. Beatty
Baking utensil, Potato....J. F. Fairbanks
Basin, Toilet....W. Rieck
Batteries, Preparing alkaline electrolytes for storage....D. P. Perry
Battery elements, Preparing storage....D. P. Perry
Bearing for upright shafts, Step....W. H. Larrabee
Beater....M. A. Valy
Bed-bottom....W. Shannon
Bed or douche pan....B. C. Williams and A. C. Scott
Bedstead lock or joint....M. D. L. Martin
Beer-drawing apparatus....L. H. Handy and W. L. Phillips
Bell-ringer....E. Wilson
Bell-striker....T. L. Willson
Bilge-drainer....C. W. Moore
Biscuits, Machine for making shredded wheat....W. E. Williams
Blast and pressure meter....E. H. Shulz
Blasting device....J. Phillips
Blowpipe....E. S. Kimball
Boat....W. N. Bell
Boat and tent, Convertible....J. Vaghi
Boiler-tube cleaner....J. Zilliox

Boll-weevil exterminator....J. W. Evans
Bolt and Nut lock. S. L. Egenas and J. B. Chapman
Book-holder....E. S. Antisdale
Book, Loose-back....C. Chivers
Boring-bit, Expansible....L. W. Garner
Bottle....L. V. Phillips
Bottle-cap....A. M. Miller
Bottle filling and capping head....G. Kirkegaard
Bottle filling and capping machine. T. G. Redington
Bottle-filling machine....T. Roberts
Bottle-stopper....G. Kirkegaard
Box....S. Bachmann
Box....A. Sabor
Box-strap reel....A. Griesbeck
Braid, cord making, and similar machines, Carrier for....A. Petersen
Braiding-machines, etc., Carrier for....A. Petersen
Brake-shoe adjuster....O. S. McCurdy
Bread raiser....J. M. McIntosh
Brick-molding machine....C. Simpson
Brine-cooling apparatus....G. F. Dickson
Broom....S. F. Frazier
Brush....F. M. Hanaway
Brush, Rotary tooth-....C. L. Phillips
Brush-stud support....B. A. Behrend
Building-block-molding machine....A. L. Post
Burglar-alarm....G. J. Deffner
Burglar-screen....E. A. Wayland
Cabinet for the sacristy....R. A. McEachen
Cable-hanger clamp....S. B. and G. B. Dusinberre
Cager and sump-guard....G. Holmes
Calorimeter....C. J. Emerson
Can-capping machine....G. W. E. Brooks
Can-filling machine....C. S. Bucklin
Cans and their heads, Machine for clenching sheet-metal....B. Adriance and A. Calleson
Cans to operating mechanisms, Device for feeding....L. C. Krummel and J. C. Taliaferro
Candy, Sugared nut-....J. H. McDonald and C. A. Hopson
Cap, Miner's....I. M. McPherson
Caps, Device for applying protectors to fulminating-....W. E. Miller
Capping-machine....C. A. Youngman
Capping-machine head....G. Kirkegaard
Car-coupling....G. E. Tomlinson
Car-coupling....E. F. Pendexter
Car draw-bar and extension-shank....M. A. Garrett
Car-fender....G. W. Mahen
Car-framework....E. C. Anderson
Car side-bearing, Railway-....J. F. Courson
Carbureter....M. D. Colbath
Carton....G. Mortson
Carton, Egg--....R. M. Odell
Cash-register attachment....O. K. Sletto
Casket-clamp for hearses or funeral-cars, Adjustable....W. A. Roe and W. H. Antes
Celery-bleaching sleeve....C. W. Mark
Cellulose article, Colored....O. Muller
Cement and making same, Package of sticky....A. Thoma
Centrifugal apparatus....H. E. Warren
Centrifugal screen....W. R. Cunningham
Characters on sheet material, Machine for impressing....C. B. Stilwell
Chasing-mill working in looped paths..G. Eirich
Check-receptacle....C. Boulard
Chenille-strip-manufacturing mechanism....W. P. Zimmerman
Chilian mill....W. B. Easton
Chuck, Drill-....C. W. Manzel
Chuck release, Lathe-....W. L. White
Churn....M. V. Dudley
Cigar....F. Meyer
Cigar-machine....F. E. Kelsey
Cigarette detachable and collapsible tip....C. A. Drucklieb
Circle-divider....N. Perris
Circuit-breaker....R. L. Browne and A. R. Howell
Clasp....J. A. Albertoni and E Tropeano
Clock, Electric self-winding....J. Steiger and J. Besancon
Clock register, Nautical-....T. Cunningham
Clutch....I. Schneider
Clutch....M. H. Fischer
Clutch, Car cable-....H. S. Robinson
Clutch mechanism for printing, stamping, and die presses and the like, Friction-....M. Rockstroh
Coal-scuttle....D. O. Hedges
Coat-fastening means....W. S. Barker
Coating articles, Dipping process for....W. G. Scott
Coating composition, Receptacle-....W. R. Long
Cock, Safety gas-....O. R. Hasty
Coin-controlled mechanism....B. M. Davis
Coke-loader....C. H. Wright and W. K. Monroe
Collection-box....E. E. Adams
Colliery and other inclines, Safety appliance for....J. Morton
Combination-rack....C. R. Haas and W. Giles
Commutator, Dynamo-electric-machine....J. E. Webster
Commutator, Dynamo-electric machine....B. G. Lamme
Compasses, Attachment for....A. E. Washburn
Compound....H. M. Sinclair
Concrete construction, Reinforced....R. D. Foster and G. Shulz
Concrete-construction reinforcing-bar..P. T. Large
Concrete-mixing machine....H. S. Scott and M. L. Dilgard
Concrete-mold....D. E. Tingley
Concrete post....E. U. Down
Concrete post....H. H. Johanning
Concrete-reinforcing bar....J. M. Dudley
Connection for co-operating members, Flexible....J. E. Webster
Container, Safety-....W. Asbury
Control system and switch....H. D. James
Conveyer, Cross-....C. L. Gardner
Cooker, Steam....F. C. Roberts
Cookers, Food-tray for steam-....M. A. Warner
Cooking-utensil....I. E. and R. Q. Lincoln
Corn-cabinet, Seed-storage....S. Babcock
Cotton-folder....F. Phelps
Coupling....J. G. Zimmerman
Croquet-arches, Socket-post for supporting....H. B. Collier
Cross-tie and rail-clamp, Metallic..H. S. Kilbourne
Crossover, Removable....C. B. Ryan
Cultivating attachment....C. S. Norcross
Cultivator swivel-wheel attachment..S. Seitner, Jr.
Culvert flexble joint....J. Doyle
Current motor, Variable-speed alternating-....R. D. Mershon
Current-rectifying apparatus....R. P. Jackson
Currents having limited strength, Process and apparatus for producing....M. M. Osnos
Cutter-thimble for grape and other picking....A. M. Southworth
Cutting-off machine....L. D. Davis
Damper-regulator....G. Steele
Cycle change-speed and back-pedaling brake mechanism....C. T. B. Sangster
Deodorizer....C. E. Blood
Depth-gage....L. B. Benton
Derrick-platform and turn-table....J. W. Page
Desk....R. T. Jackson, Jr.
Dish, Butter-....F. Schulle
Dock, Dry-....L. M Cox
Door attachment, Screen-....A. R. Gordon
Door-closure....J. Newsam
Door, Double-action double....W. P. Armstrong
Door, Grain-....G. S. Ney
Door hanger, Flush-....G. Fristad
Door-lock....W. S. Clawson
Door, Storm-....F. A. Schnreman
Douche-pan protector....E. Reynolds
Draft-ventilator....B. E. Cummings
Draw-gear apparatus....J. F. Courson
Drawbridge-gate, Automatic....A. Lichtfuss
Dress-shield....E. N. Gillard
Drier....W. E. Koop
Drilling machine, Stay-bolt-....J. Hocking
Drop-light bracket, Adjustable....P. L. Tenney
Drying and heating apparatus....L. Turk
Dye and making same, Anthracene....F. Kacer
Dye and making same, Sulfur....L. Haas
Dye, Azo....L. Hesse, O. Gunther, and A. Zart
Dynamometer....F. N. Connet
Edge-protecting clamp....G. Stiehle
Electric ground-clamp....F. Stevens
Electric-machine connection-board. J. G. Crawford
Electric machine, Dynamo-....J. D. Forrer
Electric machine, Dynamo-....B. A. Behrend
Electric machine, Dynamo-....E. Mattman
Electric machine, Dynamo-....H. A. Balcome and A. Freier
Electric machine, Dynamo-....F. E. Hirt
Electric machine, Dynamo-....W. S. Kelley
Electric machines, Winding for dynamo-....H. C. Specht
Electric motor....H. C. Grant
Electric signaling....J. Mladek
Electric time-switch....J. and J. Jones, Jr.
Electric appliance....J. S. Stewart
Electrical distribution system....B. Frankenfield
Electrode....H. Specketer
Electrode, Arc lamp....G. M. Little
Electrode, Arc lamp....S. P. Wilbur
Electromagnet-coil construction....A. A. Low
Electromagnet-coil construction....M. J. Wohl and H. Hertzberg
Elevator....W. E. Courtney
Elevator car and well door operating mechanism..H. Rowntree
Elevator-gate automatic latch, Automatic....H. A. Gilson and W. B. Beattie
Elevator mechanism, Safety....H. O. Barnes
Elevator safety device....E. E. Moulton
Emulsion and producing the same..J. Stockhausen
Engine electrical interrupter, Explosive-..G.Honold
Engine electromagnetic igniter, Explosion....G. Honold
Eraser-holder....C. Frederick
Ether, Santalol....J. Callsen
Exercising apparatus....P. S. Medart
Exercising device....A. Day
Explosive-engine....W. F. Beaton
Fabric....E. A. Outerbridge
Fanning-mill....L. O. Hage
Fastening device....R. E. Layman and J. A. Bouthillier
Fastening, Self-locking....G. Adams
Faucet....R. Bell
Faucet....J. P. Urbanek
Feed-regulator....C. M. Hall and G. P. Holmes
Feed-water heater....W. S. Ferguson
Feeding harnessed draft-animals....W. H. and J. H. Granbery
Fence clamp, Woven-wire-....W. N. Squires
Fence construction....W. M. Rankin
Fence-post....R. Toennes
Fence-post....F. E. Saunders
Fences, wire entanglements, etc., Standard or support for wire....L. Andersen
Filter....E. Burt
Filter....F. W. Pendergast and B. Hinsley
Filtering-bed....P. F. Bussman
Fire-alarm, Automatic....P. Bonini
Fire-alarm keys, Device for holding..A. and A. Iske
Fire-escape....E. J. Cooke
Fire-escape....G. W. Brooks
Fire-escape, Traveling....L. Otter
Fire-extinguisher and other air-pressure liquid-ejecting vessel....H. T. Blake
Fire-extinguisher, Automatic stationary..W. Esty
Firearm....W. L. Marble
Firearm, Revolving....O. W. Ringqvist
Fishing-roe....E. H. Crane
Flat-iron....G. H. Heindselman
Floor-scraper....F. J. King
Floor-scraper....F. F. Hase
Flue-collar and pipe-supporter, Adjustable....A. L. McElvain
Flushing apparatus....C. A. Wulf
Folding-machine....R. C. Seymour
Folding table....J. A. Keck
Fork and spade fulcrum attachment..S. L. Conde
Friction block or shoe....C. C. W. Simpson
Furnace....J. Caygill
Furnace....W. C. Wilbur
Furnace-feeder....L. P. Bolander
Furnaces, Firing....G. L. Prentiss
Furnaces, Flame-indicator for....F. Gelsthorp
Furniture, Convertible....F. H. Henning
Furs, Joining....R. Theuerkauf
Fuse, Inclosed....F. P. Poole
Game-table....J. L. Patton
Garbage and like can....H. C. Buchmaier
Garment....W. S. Barker
Garment-sleeve....J. G. Hochstuhl
Gas-burner....W. G. Frazeur
Gas-burner....H. Ruppel
Gas-engine....A. S. Krotz
Gas-engine....C. T. Wade
Gas-generator....N. Goodyear
Gas-igniting device, Electric....H. Jameson
Gas-producer....F. Muller
Gas-purifying apparatus....F. Sepulchre
Gaseous fumes or smoke, Treating corrosive....C. B. Sprague
Gear, Change-speed....P. Evans
Grate....J. W. Webb
Grate, Electrically-heated....H. Hermansen and A. Tygerson
Grease-cup....A. F. Taylor
Grinder-head....A. W. Puffer and G. W. Hayes
Grinding-mill....G. S. Emerick
Grinding-mill....W. R. Cunningham
Grinding-mill....S. Lieberknecht
Hame connection....J. A. McClellan
Hame-fastener....W. L. Roper
Hammer, Fluid-pressure....L. E. Howard
Handle-loop....W. S. Maxwell
Harvesting machine, Grain-....J. B. W. Deeds
Hay-hook....J. N. Penington and J. W. Chilton
Hay-loader....S. M. Wixcel
Head-rest....W. P. Clugsten
Heater....C. H. Henzel
Heating apparatus, Hot-water....O. Oster
Heating device, Orchard-....F. E. Barney
Heating system....J. Collis
Heating system, Car-....E. H. Gold
Heel for boots and shoes, Composite..E. C. Leahy
Heel-protectors for rubber shoes and the like, Metal....F. W. Boxer
Hinge....W. S. Maxwell
Hinge and bracket, Combined....L. Bertrand
Hinge, Pintle-....F. Meyer
Hitching device....E. L. Harmer
Horn, Amplifying-....W. Tatelbaum
Horseshoe....C. T. Humes
Hose, Flexible metallic....W. Schulz
Hot-air wall-pipe....J. W. Zuch
Hub, Wheel-....G. H. Du Bois
Hydraulic-power apparatus....A. C. Ferguson
Incubator....F. C. Perkins and C. Z. Davis
Indicator....H. P. Quiek
Induction-motor....R. E. Hellmund
Ink-supplying apparatus....M. M. Buckler
Insulator for electric wires....A. V. Siler
Insulator, Section-....H. B. Clarke
Internal-combustion engine....E. A. Rundlof
Internal-combustion engine....G. L. Crook
Ironing-table....W. T. Potter
Jar....G. T. Barr, Sr.
Jarring-machine....W. Lewis
Jetting-drill....W. Adams
Jewel-setting....H. Hess
Journal-box lid....C. A. Linestrom
Kneading machinery....W. H. Rippin
Knives, Making table-....C. E. Peck
Knuckle-opener....F. H. Wendt
Knuckle-opener, Car-coupler....F. H. Wendt
Ladder, step-ladder, and scaffold, Combined extension-....P. Bucco
Lamp....L. Schepmoes
Lamp, Arc-....S. P. Wilbur
Lamp-burner....A. W. Paull and J. A. McGinnis
Lamp-chimney....W. S. Wiley
Lamp lighting and extinguishing system, Gas-....A. Grossmann
Lantern-burner....A. F. Prahm
Last....E. Y. Austin
Lasting machine, Second-....H. F. Loewer
Latch, Gate-....T. R. Varnell
Leech, Vacuum-....J. E. Walter
Lens, Bifocal....A. E. Covelle
Light-protector....W. H. Geddes
Lightning-arrester....W. E. Butler
Lightning-arrester....W. Gifford
Lime Kiln....R. Buder
Liquid-fuel-supplying apparatus...F. Rademacher
Litharge, Making....J. E. Sullivan
Load-binder....R. L. Boyd
Lock....J. Blaszczyk
Lock....L. J. Harris
Locomotive ash-pan....J. S. Downing
Logging apparatus...J. H. and M. H. Dickinson
Loom, Haircloth-....G. S. Cox
Magnesium, Electrolytic production of....G. O. Seward and F. von Kugelgen
Mail and newspaper box....J. M. Lentz
Mail-bag catching and delivering appartus....H. R. Ladd
Mail-bag delivering and receiving apparatus....W. L. Thompson
Mail-pouch receiving and delivering apparatus for railway-cars, etc....C. W. Broughton
Mailing-machine....J. W. Orr
Mattress....I. J. Weinberg
Mattress-strap....W. W. Allen
Measuring apparatus, Whey and milk....J. Livingston
Measuring instrument....M. Picard
Measuring surface areas, Machine for....L. O. Ramsdell
Meat-tenderer....M. E. French
Metal-shearing machine....G. E. Roesch and F. F. Wright
Metals, Welding....H. Goldschmidt
Metallic material, Apparatus for treatment of....G. M. Heskamp
Metering panel-board....A. C. McWilliams
Mine-door....C. W. Carman
Mine-prop....F. Nellen
Mining apparatus....M. Goldsmith
Mirror-adjusting device....E. A. J. Germain
Mold-ramming apparatus....H. Henderson
Motive fluid, Producing....H. Maxim
Motor brush-holder....H. C. Grant
Motor-controller....H. W. Cheney
Mower attachment, Lawn-....O. S. Tuttle
Music-leaf turner....H. T. E. Covert
Music-recorder....A. Sanmell
Musical instrument, Brass wind....C. G. Conn
Musical instrument, Electrical....G. H. Davis
Musical instruments, Rotary valve for wind-....C. G. Conn
Nailing-machine....J. M. Wiggin
Negotiable instrument....H. A. Anderson
Nut-cracker....W. M. Burkie
Nut-lock....C. Girardot
Optical instrument....C. B. Boyle
Ore-crusher....C. O. Michaelson
Ore granulator or pulverizer....J. G. Kirksey
Ore-reducing furnace....C. F. Rendall
Ore-separating apparatus....W. H. Silberhorn
Organ, Folding...F. L. Caulkins and F. Wienand
Outlet-box construction....E. W. Stull
Oven-heat regulator....G. A. Stewart
Package-fastening member....W. M. Conrad
Package-tie....E. W. Milhado
Packing, Cinch-....R. R. Keith
Pail....H. E. Kerr
Paint and varnish remover....L. Ornstein
Paint, varnish, and lac, Composition for removing dried....R. G. Stewart
Paper bags, etc., Machine for making...A. Darvas
Paper holder, Toilet-....F. H. Hoberg
Paper-pasting machine, Wall-....A. C. Ross
Paper-shell-making machine....J. Chesney
Partition or book-support, Movable....R. O. Wheeler and A. H. Hilckman
Pasteurizing holding-tank....J. E. Amend
Pavement heating and rolling machinery, Bituminous....C. F. Prescott and W. E. Kerns
Pegging-machine....J. F. Davey
Penholder fountain attachment....D. O. Vaughan
Percussion-engine....W. Manss
Permutation-lock....W. Erhardt
Phonograph-records and indexes combined therewith, Cabinet for holding disk....W.A. Hobbs
Phonograph-needle receptacle....W.E. Watson
Phonograph-records and other flat articles, Holder or case for....A. C. Hafely
Photographic appliance....G. F. Fraley
Photographic film-pack, Daylight-loading....J. E. Thornton
Photographing-machine, Automatic..J. F. Raders
Piano, Automatic-playing....L. M. French and W. M. O'Brien
Piano-pedal, Auxiliary....J. Virgillito
Picture-molding....L. Cholet
Pipe-coupling....T. E. Williams
Pipe-coupling....W. H. Hammon
Planter, Potato-....P. Bernhardt, T. L. Good and C. H. Gerling
Plow....E. B. James
Pneumatic elevator....A. Rosenthal
Pocket....J. Pensalek
Pole-changer, Automatic....F. H. Williams and C. W. Welch
Polishing-machine....E. Caviechi
Post-hole digger....T. Hardy
Potato-bug destroyer....A. Lindahl
Pressure-regulating device....O. Onsrud
Prime movers, Suspension means for...R. Siegfried
Printing and similar machines, Sheet-separating device for....O. Schneider
Printing-press....B. F. Upham
Printing Press Punch, adjustable W. C. Dillingham
Propeller for Boats, drop....F. E. Stribling
Propeller mechanism, Collapsible....W. Morgan
Pump, Centrifuga....F. Neumann
Pump, Piston-....H. P. Wedin
Punching-machine....W. B. Kilgore
Push-button apparatus....R. D. Burk
Putting-out machine....F. J. Perkins
Puzzle....H. W. Cadwell
Rail, Continuous....C. E. Weaver
Rail-joint....J. S. Hickson
Rail-joint....T. K. Diehl
Rail-joint...R. T. Frederick ane J. L. Chapman
Rail-joint truss-support....L. Mueller
Railway cattle-guard....J. H. Wheeler
Railway construction....H. C. Grant
Railway-frog....B. J. Morgan
Railway-joint....D. B. Coupland
Railway overhead-line construction, Electric-....T. Varney
Railway, Pleasure-....C. M. Perdew
Railway-signal....B. E. Andress
Railway-spike....C. L. Columbia
Railway-switch....O. C. Jefcoat
Railway-switch, Automatic....G. E. Toullerton
Railway-tie....J. F. Schneider
Receptacle, Wooden....H. H. Horr
Reflector, Lantern-....O. A. Prunner
Rein or neck-strap line-terret....S. E. Harsh
Reinforcing-bar....A. E. Lindau
Releasing device....C. Hunt
Resinous matter, Recovering....W. J. Hough
Reticule....E. Lazarovich-Hrebelianovich
Reversing apparatus....G. Shulz
Rheostat, Multiple-switch....O. S. Schairer
Ring-traveler holding and delivering means....J. C. Edwards
Rivet-setting machine....A. R. Havener
Rock-drill....W. E. Portef
Rock-drill or boring-tool....J. Hutchings
Rolling-mill tube-trough....J. S. Worth and W. F. Harrison
Rolling-pin....H. E. Fendring
Rotary engine....C. McQuown
Rotary machine....C. G. Conn
Routing-machine guide device....W. H. Abler
Rubber, ebonite, or vulcanite, Manufacturing goods....O. C. Immiseh
Rubber-like gum from its vegetable sources, Extracting....F. H. Hunieke
Sad-iron, Self-heated....A. H. Davies
Safety-switch....J. T. Krieger
Sand-blast blower....D. A. M. Doublet
Sash-lifter....R. Corbin
Sash-lock....J. L. Grether
Sausage-machine....J. Wundrach
Saw-feeding mechanism....H. B. Ross, B. D. Stevens, and J. P. Gates
Saw-frame, Flexible....C. Kuseh
Saw set and clamp....F. W. McLean
Scale, Coin-controlled beam-....W. H. Jordan
Scarf-holder....E. H. Rose
Seal....J. A. Baeuerle
Seal, Car-....F. W. Brooks
Separator....A. J. Morlock
Sewing-machine attachment....C. D. Armstrong
Sewing-machine grinding attachment..G. I. Green
Sewing-machine looper mechanism...F. E. Valois
Sewing-machine, Overseaming....A. Grieb
Sewing-machine ruffler....W. R. Parsons
Sewing-machine shuttle and accessories, Rotary....J. O. Huffman
Sewing-machine work-clamp-operating device....T. M. McLaughlin and R. R. Hughes, Jr.
Shade-roller bracket, Adjustable....C. E. Sprague
Shaft construction....F. M. Remmek
Shaft-hanger....H. La Casse
Shearing-machine....C. M. Palmer
Shingle or tile, Roofing....F. W. Meyer
Shock absorber....G. Bank
Shoe and fastener therefor....L. O. Lindberg
Shoe, Sporting-....W. J. Riley
Sifter, Ash-....J. Farnworth
Sifter, Ash-....J. Markey
Sign, Advertising....J. W. Ellis
Sign, Luminius....P. L. Clark
Signal....R. L. Cairncross
Signal device....H. J. Heeney
Signal system, Supervisory....C. F. Patterson
Silk product and treatment of silk....J. Knup
Silo-packer....G. R. Rogers
Siphon....S. F. Miller
Skate, Roller-....J. H. Hollar
Skirt-trimmer....E. O. Bleehsehmidt
Sleeve-closure....W. S. Barker
Smoothing-iron....S. G. Buskard
Snap-hook....T. Forstnef
Snow-plow....C. A. Bellrud
Solder for aluminum....Z. Tamassy
Sole-edge-burnishing machine....Z. Beaudry
Sole, Galvanic....F. Kennedy and J. V. Davis
Spectacle-frames, Manufacturing..R. H. Simonds
Sprayer....D. O. Bowman
Spraying-device air-chamber, Liquid-..A.M.Phillips
Spring-wheel....L. Flum
Spring-wheel....W. H. Wildrick
Spur, Folding....J. D. Hayes
Stalk-cutter....J. A. McKay
Stamping-machine....E. B. Wilhelm
Steel, Method and apparatus for treating....W. E. Niekerson
Steels for industrial purposes, Treatment of....E. Schneider

Stencil....T. C. Hough
Stirrup....G. W. Hooks
Stoker, Underfeed fuel-....G. Weiland
Stopper....K. Friedman
Stopper....B. J. Morrison
Stove, Gas cooking-....L. Kahn
Stove, Heating-....A. K. Beckwith
Stovepipe-holder....J. N. Queen
Strainer....R. H. Carlisle
Strainer or cooker, Vegetable....W. Leetten
Street-inlet and water-closet flush, Automatic, odorless, self-cleaning....J. Pratt
Structural parts, Means for preserving..A. Knapen
Sugar, Producing milk-....A. A. Dunham
Sunshade-holder....E. H. Atkinson
Surgical knife....E. Huttmann
Sweep-rake....J. W. Brown and E. J. Keithly
Switch-key....N. H. Holland
Swivel-hook....W. R. Clarkson
Syringe....A. Bean
Tag-fastener....J. C. Harris and W. J. Flood
Talking-machine stylus-replenishing mechanism....G. Buelna and A. E. Burson
Tanks from bursting by freezing, Means to prevent....A. Ballard
Tap....A. F. Turner and F. M. Digman
Telegraph and selective system therefor, Automatic....A. C. Gilmore
Telegraph and telephone pole....J. H. Hile
Telegraph-pole arm....L. Tyreman
Telegraphy and telephony, Receiver for wireless....S. Eisenstein
Telephone desk-stand....J. A. Birsfield
Telephone-exchange selector, Automatic....F. H. Loveridge
Telephone-exchange switchboard apparatus....J. L. McQuarrie
Telephone-exchange system, Measured-service automatic....W. W. Leach
Telephone-instrument mounting...H. E. Shreeve
Telephone-key....J. L. McQuarrie
Telephone-service rent-collecting means....R. Yearneau
Telephone-system, Private branch intercommunicating....J. L. McQuarrie
Telephone-system, Private branch intercommunicating....N. H. Holland
Telephone-transmitter....A. G. Kaufman
Telephone transmitter mouthpiece....R. E. Miller
Threshing-machine....H. O. Sageng
Tie-plate....A. L. Stanford
Time-recorder....W. Beresford
Tire antiskidding device....T. I. Duffy
Tire-cover and fastening therefor....G. W. Brown
Tire inner tube, Pneumatic....H. K. Raymond
Tire plug, Pneumatic....J. Glanz
Tire-upsetter....J. H. Macdonald
Tires for wheels, Manufacturing elastic....T. L. Carbone
Tires, Making casings for pneumatic vehicle-....J. O. King
Tobacco-cutter, Rotary....W. A. Hagemeyer
Toe-calk machine....D. G. Wyman
Tongs....A. G. Kjellerstedt
Toothpick-machine cutter....H. A. Dorr
Top....T. N. Reed
Toy....S. H. Rogers
Toy air-gun....S. T. Allen
Toy motor, Electric-....H. C. Grant
Toy, Moving-picture....E. W. Davis
Toy, Musical....O. Einicke
Toy musical instrument....S. R. Divine
Track, Carrier-....W. and J. F. Mitchell
Track-laying machine....J. H. White
Track-rail support....J. W. Kemmerle
Track-sanding device....E. A. Longmire
Train-lighting system....D. C. Jackson
Tray adjustable support, Aseptic-....C. F. Booth
Tripod, Tilting-top....J. C. Fyfe
Trolley and support therefor....S. S. Goldman
Trolley-clamp....E. E. Rose
Trolley-clamp....T. Varney
Trolley-clamp....H. P. Davis
Trolley-conductor clamp....C. Aalborg
Trolley-conductor hanger....H. P. Davis
Trolley-hanger....T. Varney
Trolley-hanger....H. P. Davis
Trolley-hanger....G. B. Dusinberre
Trolley hanger and clamp....C. Aalborg
Trolley-harp....T. A. Gannoe
Trolley-wire hanger....R. B. Heimbecker and S. R. M. Orum
Trough and glass support for glazed structures, Combined....J. A. Olsson
Truck....H. C. Grant
T-slot bar....G. H. Vining
Tube and bar mill conveyer....J. S. North and W. F. Harrison
Tube-drawing device....W. T. Adams
Tube-making machine....G. A. Lutz
Tube-mill tube-trough....J. S. Worth
Turbine, Elastic-fluid....B. Ljungstrom
Type-writer....G. W. Downing
Type-writing machine....W. F. Helmond
Type-writing machine....J. J. Cooper
Type-writing machine....J. C. Doane
Umbrella, Folding....P. L. Page
Umbrella-lock....R. E. Adams
Undergarment....R. M. Sidey
Upholstering attachment....H. G. Westmore
Upholstering-machine....L. Karpen
Urinal-ventilator....A. J. Cheney
Valve....F. C. Smith
Valve....L. Schutte
Valve....C. Wainwright
Valve, Flush-....E. Nanfedt
Valve for gas-mains, Goggle-....L. Shaw
Valve, Gas-regulating....C. C. Armstrong
Valve gear, Air-....E. A. Rix
Valve, Lavatory supply-....W. A. Speakman
Valve, Triple....W. V. Turner
Valve, Triple....J. W. Cloud
Vapor-electric-apparatus system....F. Conrad
Vapor-generator....R. W. Zierlein
Vapor-rectifiers, System of distribution for....F. Conrad
Vault, Burial-....W. E. Haworth
Vehicle....D. H. James
Vehicle automatic brake....F. D. Kaser
Vehicle-brake, Automatic....G. R. Kelly
Vehicle foot-board....J. Hage
Vehicle shock-absorber....F. N. Rosenstengel
Vehicle-wheel....B. C. Oblinger
Vehicle-wheel....C. L. Shaw
Vehicle-wheel....T. B. Jeffery
Veil-clasp....B. Honsowetz
Ventilator....F. G. Andrews
Violin chin-rest....G. Beisheim
Wagon-brake....W. L. Roper
Well-drilling apparatus....H. B. Walker
Washing compound and making same, Clothes-....J. H. Schlueter
Whalebone stretching and straightening machine....O. Holzhauer
Wheelbarrow....R. T. Todd
Wheelwright's tool....F. M. Sturgis
Whip....H. Flesch
Whip-socket....J. H. Larson
Windmill-regulator....M. S. Newcomer
Window or shutter operating mechanism....E. Van Noorden
Window-screen....D. M. Henry
Wire-bender....J. S. Pratt
Wires and cables, Hanger and clamp for. C. Aalborg
Wrapping-machine....A. M. Price
Wrench....F. Smith
Wrench....J. J. Parsons
Writing-machine....E. B. Hess
X-ray apparatus....E. W. Caldwell

DESIGNS.

Box, Work-....J. J. Giles
Chair, Barber's....C. Pfanschmidt
Map-casing....H. C. Staby
Metal ornament....J. W. Anthony

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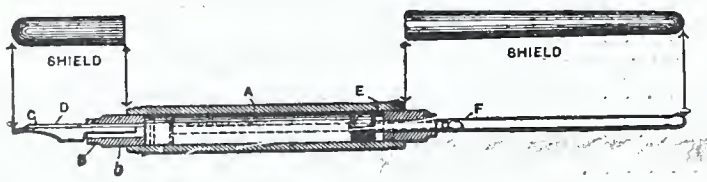
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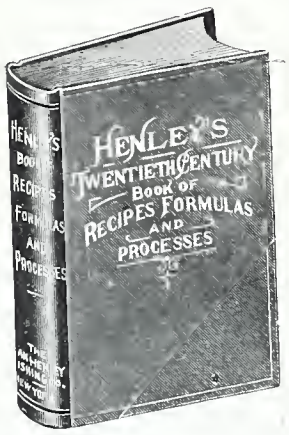
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BATTLESHIP ARMOR.

By C. VAN LANGENDONCK.

THE first suggestion of using armor plate for the protection of ships of war against artillery fire dates from 1805, when an Englishman, William Congreve, designed a floating mortar battery of 250 tons displacement, which was to be covered with plates and bars of iron, so as to be invulnerable to an enemy's fire. Nothing came of this however, and the next recorded advocate was John Stevens of New Jersey, who submitted plans for an armor vessel to the United States Government. Some years afterwards his son, having carried out experiments to ascertain what thickness of iron would keep out various calibres of shot, prepared careful plans for the application of armor to ships. The matter however did not go beyond the experimental stage, but the total destruction of the Turkish fleet by the shell fire of the Russian Squadron at the battle of Sinope, November 20, 1853, convinced the various governments of the necessity of introducing some means of protection, and in the following year the United States first and then France and England put into service armored floating batteries. These had a displacement of from 1200 to 1600 tons, a speed of about four knots and were completely iron clad, the thickness of armor varying from 4 inches to 4½ inches of wrought iron, backed by from 24 inches to 28 inches of oak. The French batteries were almost immediately put to the test of an actual engagement, during the Crimean war. After a five hours' cannonade at a range of from 700 to 1000 yards, the fortress of Kinburn, which mounted 51 casemated guns, was reduced and forced to surrender. On board of the floating batteries the fire of the fortress had occasioned not the least casualty, and the armor was not penetrated. The advantages of armor were thus demonstrated, and in 1861 England and France, and soon afterwards the United States, had armored sea going squadrons afloat.

During the Civil War the value of armor was constantly demonstrated, and since those days, similar instances may be multiplied; but it suffices to say that all reliable evidence, including that afforded by the recent Russo-Japanese war, goes to show that armor does not behave in the erratic manner which is sometimes alleged, and that proving ground and experimental results may be relied on as guides to what may be expected in action.



FIG. 1.—LARGEST ARMOR PLATE EVER MADE.

Even comparatively thin armor gives an advantage, as not only will it keep out high explosive shells to a great extent, and, to a less degree, powder filled common shells, but it will also, unless greatly overmatched, deflect armor piercing projectiles striking at an angle. The introduction of armor was, of course, met by increasing the power of the gun and the quality of the projectile. This led to the thickening and improving of the armor, so that in the twenty years between 1858 and 1878 we find that the thickness of armor increased from 4½ to 24 inches, while the 5½ inch 68-pounder developed into the 16 inch 1700 pounder, and cast or wrought iron round shot were superseded by chilled iron or steel projectiles. The increased thickness and weight of armor necessitated a corresponding reduction in the armored area, and we pass gradually from the thinly but completely iron-clad "warrior," with a mixed battery of 8 inch and 7 inch guns of 9 and 6½ tons respectively, to the "inflexible," with her small but thickly armored central citadel and her four 16-inch 81 ton guns.

It is about the date of the inflexible, 1876-1877, that we find wrought iron armor being supplanted by steel and compound plates, the former introduced by Messrs Schneider in 1876, the latter by Mr. Cammell in 1877. Steel was harder, but at the same time more brittle than wrought iron, while the compound plate had the advantage of combining a hard steel fabric to break up the attacking projectile with a tough wrought iron back to hold the plate together. Its weakness, of course, lay in its being non-homogeneous throughout, the surface plate being liable to crack and scale off under attack. The average resisting power of both, however, was about the same, and may be taken as equivalent to 1½ times that of wrought iron. For several years compound armor more than held its own against steel, but the manufacture of the latter gradually improved, so that in 1890 the best steel plates were probably better than the best compound.

The process introduced by Captain Tresidder, of face hardening plates by chilling their headed surface with jets of water, raised the resisting power of compound beyond that of the best all-steel armor; but compound plates hardened by this process were almost immediately superseded by steel plates made by the Harvey process, which had the effect of giving a plate of homogeneous material the properties of a hard face and tough back, hitherto only possible by superimposing a hard steel surface upon a wrought iron or mild steel foundation

plate. Harvey effected this great improvement by keeping the face of his steel plate for some weeks at a high temperature in contact with carbon. The Harvey and Tresidder processes, which soon became combined, raised the standard of steel plate: further improvements were introduced by Krupp, and the resisting power of steel plates in 1893 was about 2½ times that of wrought iron. Nickel steel had first been introduced by Messrs Schneider in 1889, and came promptly into general use. It combines great tensile strength and hardness with a high elasticity and ductibility.

The French St. Chamond Works added to this nickel steel a small percentage of chromium, and this combination is now invariably used in Krupp armor: it insures still further the hardness and toughness of the plate. The modern process of manufacturing these nickel chrome steels into armor plate is long and complicated. The range of temperature in each of the various operations is restricted, and great care has to be taken to prevent the limits being passed.

There are two kinds of Krupp plate, cemented and non-cemented. The term cementation is applied to the process of superficially carbonizing one side of a plate, with a view to obtaining greater hardness. One of the principal features of the Krupp process consists in the extreme accuracy with which the material is treated thermally. Vigilance and long experience are necessary, if good and uniform results are to be obtained. A special plant of great power is also required for carrying out the process, so that it is not surprising to learn that the cost of the finished product averages something like $500 per ton.

A variety of armor which demands notice, although more or less obsolete, is chilled cast iron. It was never used for naval purposes, but at one time it was largely employed in the land defenses of the Continent, in the form of armored cupolas. It was exceedingly hard, and practically unperforable, but could be destroyed by fracture, and would crumble away under the continuous bombardment of steel projectiles from guns of medium calibre. It was therefore mainly used on sea fronts, where it was admirably suited to resist the few rounds that the heavy guns of battleships might be expected to deliver during an attack of limited duration. Its lineal successor is cast steel armor, specially made by Messrs Krupp. Fig. 1 of the illustrations shows such a plate, having dimensions of 45 x 11 by 1 ft., and a weight of over 100 tons. This is the largest armor plate which ever has been made.

The characteristics of cast steel armor are very different from those of chilled iron. Although not equal in resisting power to rolled cemented steel plates, this cast armor can nevertheless be made superior to ordinary forged steel, and have at the same time remarkable toughness. It would hardly seem possible, however, for the same evenness of quality to be obtained with cast armor as with forged plates, on account of the extreme difficulty of getting heavy castings free from blowholes or other internal flaws. On the other hand, it should be cheaper than forged armor, and quicker to make, should time be a consideration. Fig. 2 shows a test at the Krupp testing fields. with a cast nickel steel armor cupola for land defense. Fig. 3 illustrates a test of the Schneider steel for ships. Of course the preceding is only a very general account of the processes of armor manufacture, as most technical details are kept secret by the manufacturing firm.



FIG. 2.—TEST WITH A CAST NICKEL STEEL ARMOR CUPOLA FOR LAND DEFENSE AT KRUPP TESTING FIELDS.

The effectiveness of attacks on armor depends upon tbe nature, weight, diameter, velocity and angle of incidence of the projectile. The armor-piercing projectile of to-day is an ogival-headed cylinder of specially hardened and tempered steel. The composition varies according to the manufacturer, but, in addition to carbon, it almost invariably contains chromium and generally nickel. The armor-piercer is usually a shell of low capacity; that is, it contains a cavity which is capable of taking a bursting charge of about 2½ degrees of the total weight of the shell. It is generally made of steel, but some shells are cast. Capped armor-piercing shells of modern type are, as a rule, capable of perforating a Krupp cemented plate of a thickness adapted to their calibre, at a velocity of from 1800 to 1900 feet a second. Uncapped shot require a considerably higher velocity to cut a similar plate, and their action is a punching and not a perforating one on hard-faced plates. When attacked, a plate may yield in three ways: it may be fractured and broken up without being perforated, as in the case of chilled iron armor; it may be perforated or bored, as in the case of a relatively soft plate, such as wrought iron, when overmatched by a pointed projectile; or it may yield through a plug, or more generally, a large coned disc being punched out of it.



FIG. 3.—TEST WITH SCHNEIDER SPECIAL STEEL FOR BATTLESHIPS.

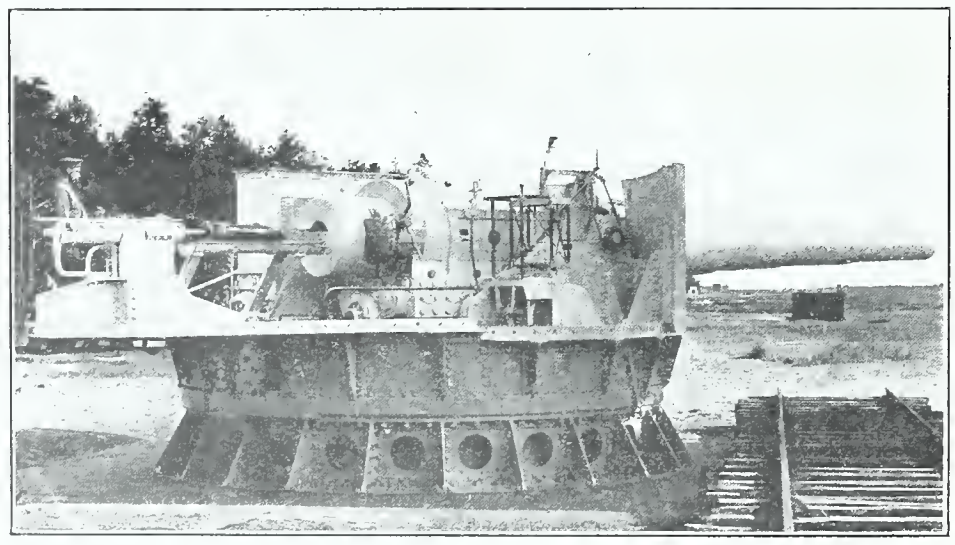


FIG. 4.—10 INCH BATTLESHIP GUN WITH SHELL.

Common shells, which are not strong enough to hold their shape upon impact, derive no benefit from the cap, and invariably overcome a plate by punching rather than by perforation. High explosive shells, unless special arrangements are made to deaden the bursting charge, and so obviate detonation upon impact, are only effective against the thinnest armor. Within certain limits, the resisting power of all hard-faced plates is very much reduced when the armor-piercing projectiles used in the attack are capped. The cap, which was first taken up in Russia in 1894, consists of a thimble of comparatively soft steel, of from 3 to 5 per cent of the weight of the projectile, attached to the point of the latter. Its function appears to be to support the point on impact, and so to enable it to get unbroken through the hard face layers of the plate. Once through the cemented portion with its point intact, a projectile which is strong enough to remain undeformed, will, if its velocity be high enough, perforate the plate by a true boring action. Fig. 4 shows a 10-inch gun ready to be loaded with shell.

EQUIVALENT TO A COLLEGE.

What Cornell University Thinks of The Yale & Towne Works.

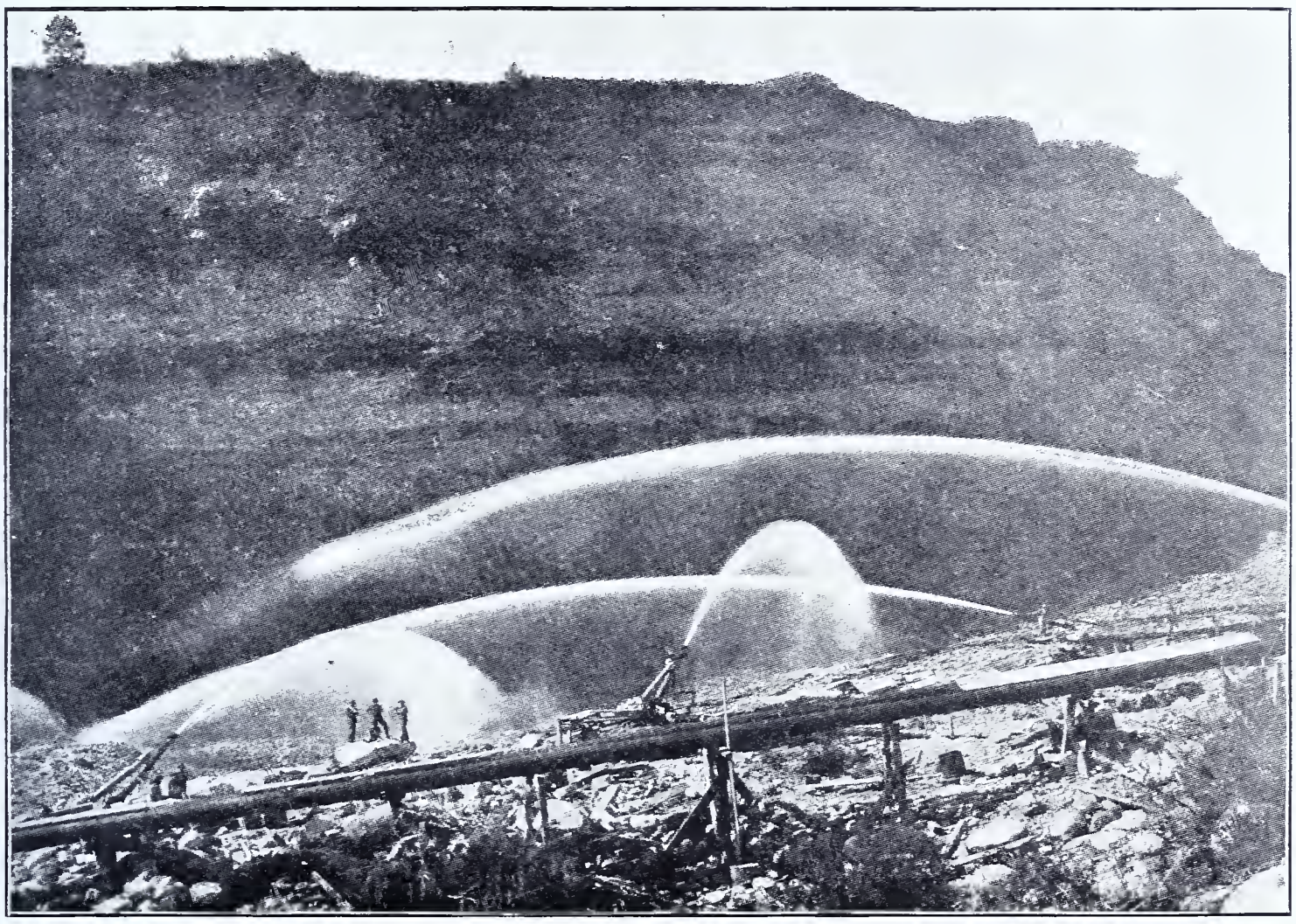
A student of Sibley College, Cornell University, inquiring as to how much credit he would obtain for shop work done during the vacation, was told that it was the practice to give one hour's credit for every two hours devoted to actual work in a shop or foundry, provided the latter were approved by the faculty as a proper place for gaining useful experience.

Asking if the Yale & Towne Works at Stamford, Conn. would fit this description, he was informed that double credit would be given for any time spent in these works, as, in the opinion of the faculty, it was tbe full equivalent of the instruction given at the college, and that in this respect it ranked with very few of the leading industries of the United States.

WATER POWER AND ITS NEW USES.

THE recent struggle to preserve the scenic beauty of Niagara Falls from the depredations of the power companies working in the vicinity, ending in protective legislation on the part of the last Congress, emphasizes the growing utilization of our water forces for electrical purposes. When it is recalled that the plants which are now operating near Niagara had the right to abstract enough water from the current above the falls to cause the American channel to lie as dry as a bone, the imminence of the danger to one of the wonders of the world will be realized. It is being daily more appreciated, however, that the main dependence of the future for power must reside in the fuller development of our water powers. The time is not distant when every stream capable of developing horsepower will be harnessed to electrical machinery, delivering energy to nearby mills or remote cities. The fullest utilization of this source of cheap power awaits the perfection of methods of electrical transmission and transformation, which are as yet crude and wasteful. Nevertheless, great progress is being made in this direction, and in the West especially, currents from the Rocky Mountains serve to turn the wheels of street cars and illuminate the streets in many a distant city. One of the huge pipe lines employed for transmitting water is shown in the accompanying illustration, as well as an example of hydraulic mining. When it is remembered that five hundred million dollars in gold have been taken out in the Northwest states and territories by placer mining, of which hydraulic mining is the most efficient form, the importance of this agent is obvious.

In the copper mines in the vicinity of Lake Superior, the water power has been utilized in a novel manner. The distance from the source to points of application is not great, and the power is distributed by compressed air. The falling water operates directly on the air without the intervention of water wheel or other machine.



HYDRAULIC MINING IN NEVADA.

Roughly speaking, this hydraulic air compressor consists of a large underground chamber cut from the solid rock, and having a length of some 280 feet, a width of 18 and a depth of 26 feet. In normal operation, the the lower portion of the chamber is filled with water to a level of 14 feet from its roof. The remainder is filled with air at 114 pounds gauge. The water outlet is through a tunnel 18 feet wide and 10 feet high. the bottom of the tunnel being a continuation of the horizontal floor of the chamber. This tunnel opens into an inclined shaft, the discharge level of which is 271 feet above the water level in the chamber. The outlet for air is a 24-inch pipe leaving the chamber through the roof directly above the tunnel outlet.

The inlet for both water and air is through 3 vertical shafts each 5 feet in diameter, opening through the roof of the chamber at the farthest end from the outlets. From water level in the chamber through the air and water tight shaft to the water level at the intake above is 343 feet. This is 72 feet greater than the distance between the water levels at the outlet end, and this difference expresses the available head of water.

At the intake, water is admitted through an annular funnel over a hollow ring from the periphery of which project 1800 small tubes. The water must flow over the mouths of these tubes, and in doing so it produces the aspirating effect which entrains the air in small bubbles. The mixed water and air fall through the vertical shaft, and are discharged below. The current through the chamber is slow, and the air disengages itself, collecting in the top of the chamber and displacing the water. By its pressure on the water surface in the chamber, it maintains the 271 feet of difference in level between that surface and the one at the discharge of the outlet shaft.

When running at less than full capacity the water level in the chamber is prevented from being depressed further than 14 feet from the roof by means of a blowoff pipe which opens below the normal water level. When the water has been pushed down sufficiently, air enters this pipe and its escape relieves the excess of pressure. When the blowoff is in operation, the appearance at its mouth resembles the eruption of a powerful geyser. The stream of spray due to the entrance of the water with the air from the chamber, is thrown at times to a height of 400 feet.

With the use of this compressor, it has been found possible to deliver 12,000 cubic feet of air per minute at 128 pounds absolute pressure. Besides utilizing cheap power, it has the advantage over the usual machinery in the absence of parts to get out of order and in low cost of attendance.

The special industry of the Niagara companies, however, is a new one to this country—electro-chemistry. Long since developed in Germany, this branch of science received attention in America only when advantage was taken of the unequaled opportunities for power production offered by the great cataract. The low rates at which power can be sold there have caused an enormous growth of electro-chemical industries in the neighborhood. Calcium carbide, aluminum, caustic soda, bleaching salt, carborundum and graphite are among the products that have been made commercially possible by this transformation of water power into electric energy. Calcium carbide, used in the production of acetylene gas, either for artificial illumination or for the manufacture of ethyl alcohol, is produced by subjecting a mixture of carbon and lime to the prolonged action of heat in an electric furnace. Aluminum, the valuable metal present in clay, bauxite, and other mineral substances, is electrolytically deposited from a bath of alumina. Caustic soda and bleaching salt are produced by the electrolytic decomposition of brine. Carborundum is a valuable substance produced by the action of the heat of an electric furnace on a mixture of carbon and sand. It has an extensive use as an abrasive for grinding and polishing. Artificial graphite is another product created by the long continued action of the heat of the electric furnace on carbon under certain conditions.



FLUME FOR CONVEYING WATER.

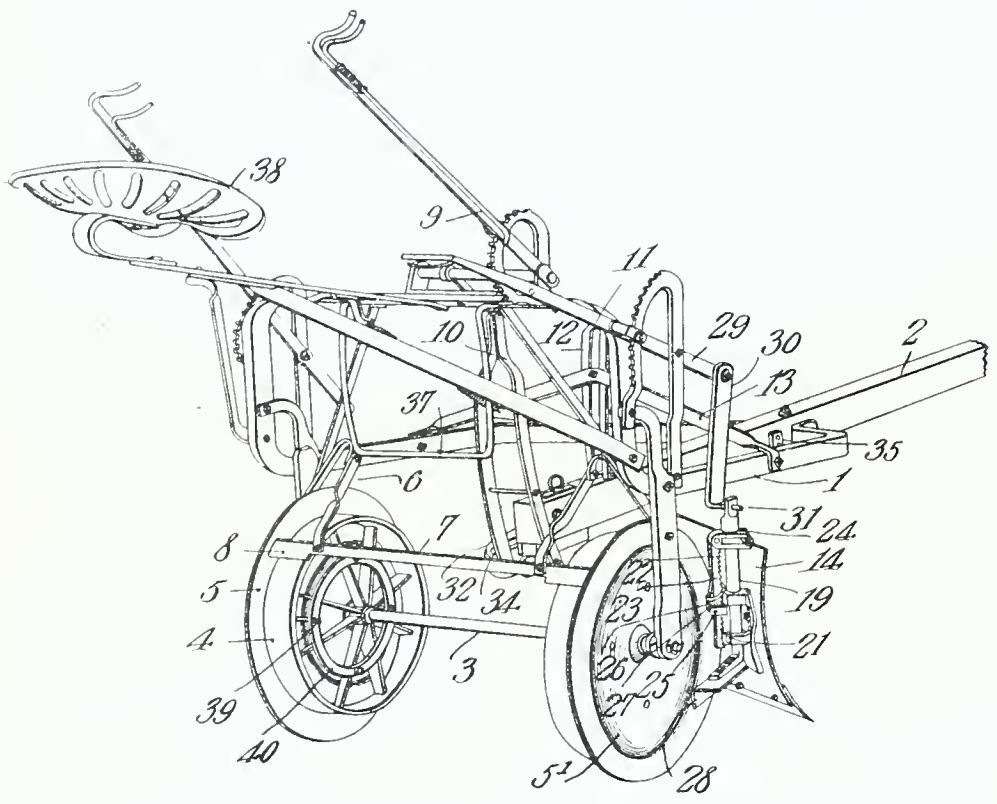
Among the surprises which electro-chemistry may have in store for the world may be a nearer approach to the mastery of the laws which govern the combination of elementary substances when under the influence of plant life. If these laws ever become so well known that man is able to form in his laboratory the various food products that are now formed naturally in plant organisms, such a revolution would be wrought that the work of the agriculturist would be largely transferred to the electro-chemist. Some little has already been done in the direct formation of vegetable substances, such as camphor, the peculiar flavoring substance present in the vanilla bean, etc. Should such discoveries ever reach to the direct formation of some food staple, the wide reaching importance and significance of the discovery would be almost beyond comprehension.

CLEVER NEW PATENTS.

ROAD SCRAPER.—WATER ELEVATOR.—NECK YOKE HOOK.

Road Scraper.

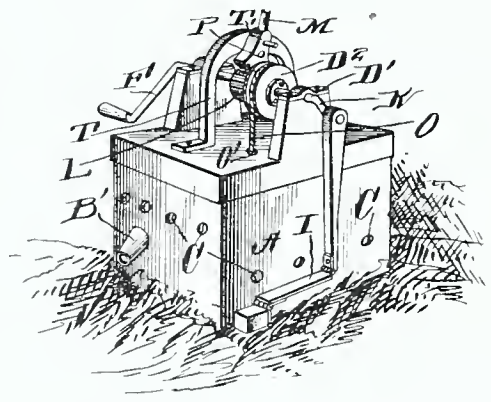
An apparatus for scraping roads that has several novel advantageous features has been patented by James H. Osten, of White City, Kans. The scraper has a wheel mounted frame with a draft tongue attached thereto and means for pivotally adjusting the tongue thereon. A scraper blade is pivoted to the tongue, and lever mechanisms are mounted upon the frame and are adapted to be connected with the end portion of the scraper blade, to raise or lower the same. The blade may swing horizontally as well as vertically with relation to the tongue, and means for bracing the scraper blade with relation to the tongue is provided. Vertical adjustable colters are mounted at the ends of the scraper blade, and form means whereby the lever mechanisms above referred to are connected with the blade. Said colters are adapted to retain the blade against side draft with relation to the frame of the implement. The wheels upon which the frame is mounted are also provided with annular flanges located at their outer edges, which are adapted to prevent the tendency of side draft. As may be seen in the cut, the frame is mounted on the axle, and arms 6 carry a cross bar 7, the ends 8 of which serve as scrapers for the wheels. The lever mechanism 9 is connected with the tongue by means of a link 10, and through the lever and link the tongue 2 may be swung vertically and secured by a clamp bolt 11, which operates in an elongated slot in the upright 12 and in a perforation in the cross bar 13. The scraper blade 14 is pivoted to the tongue and by means of a pivot pin acquires a vertical as well as a horizontal movement. Guides are mounted upon the rear sides of the

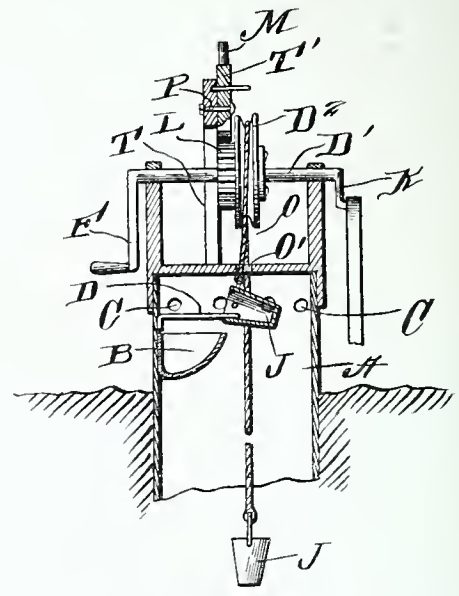


blade, and colter shanks 19 pass through the guides and have perforations 20 at their upper ends, which project above the upper edge of the blade. Teeth 21 on the lugs 18 mesh with the teeth 22 on the bar 23, which is pivotally connected at its upper end with the clamp member 24 mounted on the shanks 19. The annular colter blades 28 are attached to the lower ends of the shanks 19 and adapted to come in contact with the surface of the soil, to prevent the scraper blade from having side draft. The levers 29 are fulcrumed upon the frame 1 and links 30 are pivoted to said levers, each link being provided with a pin 31 adapted to pass through the eye of the shank 19 located at the same side of the implement as that upon which said link is located. The semi-circular brace is attached to the rear side of the scraper blade 14 and is provided with perforations in which the brace rod 34 may be inserted, the forward end of the same being inserted in a perforation of a lug mounted on the tongue. This rod, together with the brace, holds the scraper blade 14 at any desired angle. As the blade is located in advance of the wheels 1, it will make the surface of the road even, so that the machine will run smoothly.

Water Elevator.

A novelty in this class of apparatus is offered by a South Carolina inventor, James L. O. King, of Seneca. He mounts a trough on the well curb, with a spout passing through an aperture in the curb. The latter is provided with perforations *C* (see illustration) for suitable ventilation, and horizontal bars *D D*, made preferably integral with the trough, extend over the same and in a downward direction. Mounted in suitable bearings on the top of the curb is a crank shaft upon which is a grooved pulley, and which has a handle *F* for rotating it. It also has a short crank *K* to which a tread member *I* is connected, thus permitting it to be operated by foot or hand power. If desired to reduce friction, suitable ball bearings may be employed. A cable *O* passes about the pulley and through apertures in the top of the curb, and buckets *J* are fastened, one on each end of the cable. Pivoted on a pin *P* carried by the standard *T* is a segment ratchet member *T*¹, the teeth of which mesh with the teeth of a gear wheel *L* fixed to the crank shaft. The segment member has a lateral projecting handle *M*, whereby the same may be rocked upon its pivot and thrown into engagement with said wheel for the purpose of holding the shaft from rotation in one direction or the other. As the shaft is rotated (by hand or foot power or by any form of lever mechanism) one bucket or the other may be drawn from the well onto the curb, and as the edge of the bucket

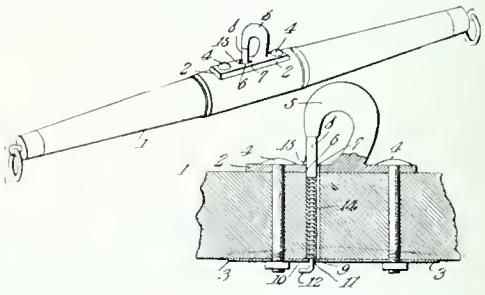




comes into contact with one or the other of the horizontal bars, the contents of the bucket will be emptied into the trough. If it is desired to hold the bucket at any suitable location, this may be done by swinging the segment member so as to engage the gear wheel upon the crank shaft. A reverse movement of the shaft will lower one bucket and raise another, and the operation may be repeated.

Neck Yoke Hook.

Lawrence M. Snyder, of Reynoldsville, Pa. has invented a simple and effective device of this class, adapted to be used chiefly in connection with that portion of harness attachment known as a jockey neck yoke. Upon opposite faces of the yoke 1 (see accompanying illustration) are mounted plates 2 and 3, assembled by means of a bolt 4, the top plate forming a base for a hook 5, the extremity of which is bent down and disposed above a circular aperture 6 in the top plate, from one side of which aperture projects a slot 7. This aperture is carried downward through the neck yoke, and a locking bolt with a body portion 8 is adapted to slide and rotate therein. This body portion is provided with a radial stud 15, which contacts with the upper face of the top plate 2. The stud 15 is so positioned upon the body 8 that when it is in contact with the upper face of the top plate, the upper extremity of the bolt will be in contact with the end of the hook 5. The bolt is diminished at its lower end, 9, which passes outward through an aperture 11 in the bottom plate 3, the extremity being overbent at 12 to form a finger hold, whereby the locking bolt may be slid in the channel 10 in the neck yoke. A coiled compression spring 14 surrounds the end 9 of the bolt and abuts against the body portion 8 at its upper end, and at its lower end against the bottom plate 3. When the parts are in the position shown in the cut, it will be seen that since the stud 15 is in contact with the upper face of plate 2, the locking bolt is held in contact with the extremity of the hook 5. When it is desired to free the bolt from this contact, the overbent end 12 is grasped below the bottom plate 3, whereby the bolt may be rotated to bring the stud 15



into vertical registration with the radial slot 7 in the plate 2. The bolt may then be drawn downward, opening the hook 5. When the portion 12 of the bolt is released from the grasp of the fingers, the bolt will fly upward into its contact with the hook 5, being actuated by the spring 14. The portion 12 of the bolt may then be swung laterally to move the stud 15 out of vertical registration with the slot 7, whereupon the bolt will be held securely in contact with the terminal of the hook 5.

PATENTS

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LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

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UNION MATCH CO. v. DIAMOND MATCH COMPANY.

(Circuit Court of Appeals, Eighth Circuit. April 17, 1908. 162 F. R. p. 148.)

1. PATENTS — CONSTRUCTION OF CLAIMS—REFERENCE TO SPECIFICATION.

Where the claims of a patent specify the elements of a combination, but do not specify the means whereby those elements perform their functions but call for "means" generally, and close with the words "substantially as and for the purpose" described, or specified, or set forth, such words import into the claims the specific means described in the specification, and the claims are limited accordingly.

2. SAME—CLAIMS FOR FUNCTIONS—MACHINE FOR BOXING MATCHES.

The Palmer, Denmead & Baughmau patent, No. 538,535, for a machine for boxing matches, claims 1, 2, 3, and 4, for a combination of means for jarring the matches into parallelism after they drop into the boxes, claims 23, 24, 26, and 30, for means for temporarily dividiug the boxes into compartments while being filled, are not void as for functions of mechanism only, but, read in the light of the specification to which they refer, are for specific means to accomplish defined results. Such claims, however, are limited by the prior art to a narrow construction and a narrow range of equivalents.

3. SAME—IMPROVEMENT PATENTS—EQUIVALENTS.

When the invention of a patent is along the lines of past efforts, which have met with more or less success, and the inventor has made only an improvement in an art already well advanced, the range of equivalents should be reduced accordingly.

4. SAME — INFRINGEMENT — COMBINATION PATENT.

No device can be held to iufringe a combination claim of a patent, unless it employs all the elements of it.

5. SAME.

A patent for a described means or mechanism to accomplish a desired end must be limited to the particular means described in the specification, or their clear mechanical equivalents, and does not cover any other mechanical structure which is substantially different in its construction or in its operation.

6. SAME—MACHINE FOR BOXING MATCHES.

The Palmer, Denmead & Baughman patent, No. 538,535, for a machine for boxing matches, claims 1, 2, 3, 4, 23, 24, 26, and 30, are not infringed by the machine of the Wyman patent. No. 736,668, which, while it accomplishes the same results, does so by different means and methods of operation, and, furthermore, does not contaiu all the elements of such claims or their equivalents.

JONES et al. v. F. A. HARDY & CO.

(Circuit Court, N. D. Illinois, E. D. June 25, 1908. 162 F. R. p. 320.)

PATENTS—INFRINGEMENT—EYEGLASSES.

The Finch patent, No. 666,928, for eyeglasses, construed, and held not infringed.

BRENNAN & CO. et al. v. DOWAGIAC MFG. CO.

DOWAGIAC MFG. CO. v. BRENNAN & CO. et al.

(Circuit Court of Appeals, Sixth Circuit. June 18, 1908. 162 F. R. p. 472.)

1. PATENTS-INFRINGEMENT—GRAIN DRILLS-PROFITS RECOVERABLE.

The Hoyt patent, No. 446,230, for a grain drill, is not for an addition to an otherwise complete machine, but is for a combination of elements, some of which are old, to accomplish an improved result, in which each element, whether new or old, is an essential part of the invention, and the liability of an infringer who has appropriated the combination as a whole is not limited to the profit made on any particular element, but extends to the profit made on the entire machine.

2. SAME — LIABILITY OF INFRINGER—CONFUSION OF PROFITS.

Where no other invention inheres in a patented combination, and it is not merely for an improvemeut, but for a new structure, an infringer who has deliberately copied such structure cannot avoid liability for the entire profits made thereon by adding improvements of his own, which do not materially add to its sale value, and by so conducting its business as to make it impossible to separate the profits due to each.

3. SAME—ACCOUNTING.

On an accounting for profits by an infringer, the measure of recovery is the amount of profits actually made by the defendant by the sale of the patented device, and it is immaterial that such sales would probably not have been made by complainant.

DOWAGIAC MFG. CO. v. SUPERIOR DRILL CO.

(Circuit Court of Appeals, Sixth Circuit. June 18, 1908. 162 F. R. p. 479.)

PATENTS—PROFITS RECOVERABLE FOR INFRINGEMENT — CONFUSION OF PROFITS BY INFRINGER.

Where no other patented structure is shown to have contributed to the profits of an infringer of a patent, and the infringement was deliberate and intentional, the defendant cannot avoid liability for the entire profits made on the structure by so confusing those made on the patented and unpatented parts that the portions due to each cannot be separated or ascertained.

HENDEY MACH. CO. et al. v. PRENTICE BROS. CO.

(Circuit Court of Appeals, First Circuit. May 27, 1908. 162 F. R. p. 481.)

PATENTS— INFRINGEMENT—FEED MACHINE FOR SCREW-CUTTING LATHES.

The Norton patent, No. 470,591, for a feed mechanism for screw-cutting lathes, limited to the details of the arrangement of the parts, as required by the prior art, is not infringed by the machine of the Newton patent, No. 787,537, in which the second series of gear-wheels, or cone gears, are not located on the feed-shaft, as required by the claims of the Norton patent.

RICHARDS et al. v. MEISSNER et al.

(Circuit Court, W. D. Missouri. May 4, 1908. 162 F. R. p. 485.)

PATENTS—SUIT TO OBTAIN ISSUANCE OF PATENT—ISSUES.

A suit under Rev. St. § 4915 (U. S. Comp. St. 1901, p. 3392), is for the purpose of establishing complainant's right to a patent which has been refused by the Patent Office; and, where such patent was granted to the defendant after interference proceedings, complainant is not entitled in such suit to introduce evidence to prove that the patent is void for anticipation, an issue which was not, and could not have been, tendered by the bill.

E. J. MANVILLE MACH. CO. v. EXCELSIOR NEEDLE CO.

(Circuit Court, D. Connecticut. June 12, 1908. 162 F. R. p. 486.)

PATENTS — INFRINGEMENT — MACHINE FOR FORMING NIPPLES.

The Campbell patent, No. 594,457, for a machine for forming nipples such as are employed in the building of wire spoke wheels for bicycles and similar vehicles, discloses invention of such merit and covers a machine of such value and success in operation as to entitle it to a reasonably liberal construction and fair range of equivalents. As so construed, held infringed.

ECONOMY LOCOMOTIVE SANDER CO. v. AMERICAN LOCOMOTIVE SANDER CO.

(Circuit Court of Appeals, Third Circuit. Dec 18, 1907. 162 F. R. p. 683.)

PATENTS — INFRINGEMENT — LOCOMOTIVE TRACK SANDER.

The Leach patent, No. 433,686, for a locomotive track sander, discloses patentable novelty and invention; also, held infringed.

AMERICAN LOCOMOTIVE SANDER CO. v. ECONOMY LOCOMOTIVE SANDER CO.

(Circuit Court of Appeals, Third Circuit. Dec. 18, 1907. 162 F. R. p. 684.)

PATENTS—PATENTABLE NOVELTY—LOCOMOTIVE TRACK SANDER.

The Leach patent, No. 656,553, for improvements in pneumatic track sanders for locomotives, discloses no new principle of operation, functional capacity, or inventive feature over the device of patent No. 433,686 to the same patentee, and is void for lack of novelty.

DR. A. REED CUSHION SHOE CO., Limited, v. FREW et al.

(Circuit Court of Appeals, Second Circuit. June 29, 1908. 162 F. R. p. 887.)

1. PATENTS—ASSIGNMENTS—EFFECT.

Mere assignments of patents for the manufacture of shoes, having cushioned insoles, did not carry the right to the assignee to use the patentee's name in connection with shoes manufactured under such assignments.

2. SAME—SCOPE OF REVIEW.

Complainant, having acquired a patented device for making cushion insoles in shoes, was permitted by the inventor to use his name in connection with the manufacture and sale of such shoes, which by extensive advertisement became well and favorably known, after which the inventor made certain improvements on such soles and formed a corporation of which he was president, and in which he had substantial interest, which licensed the right to manufacture and sell shoes under the later patents. Held, that such corporation and its licensees were only entitled to use the inventor's name in manufaeture and sale of their shoes in connection with au express statement that such shoes were not those made under the original patent.

CONSOLIDATED RUBBER TIRE CO. et al. v. DIAMOND RUBBER CO. OF NEW YORK.

(Circuit Court of Appeals, Second Circuit. June 3, 1908. On Rehearing, June 17, 1908. 162 F. R. p. 892.)

1. COURTS—PRECEDENTS.

Where a Circuit Court of Appeals has sustained the validity of a patent after full consideration in a contested case, it is not required to re-examine the question de novo in a second case on the same evidence or additional evidence which is merely cumulative.

2. PATENTS — INVENTION— RUBBER TIRED WHEELS.

The Grant patent, No. 554,675, for a rubber tired wheel. was not anticipated, and discloses invention. Also, held infringed.

3. SAME—DECREE GRANTING INJUNCTION—LIMITATION OF INJUNCTION.

A decree enjoining infringement of a patent may properly provide that it shall not apply to a sale by defendant of articles made by defendaut in auother suit brought by complainant in another circuit in which the patent was adjudged void; but the proviso will not be extended to cover other articles made in the latter circuit, where the question of such right is not directly involved under the evidence.

BOWERS v. ATLANTIC, GULF & PACIFIC CO.

(Circuit Court, S. D. West Virginia. Nov. 19, 1907. 162 F. R. p. 895.)

1. PATENTS—SUIT IN EQUITY FOR INFRINGEMENT—NECESSARY PARTIES.

In a suit in equity by a patentee for infringement, where the bill discloses that complainant contracted to convey to another an interest iu the patent by way of assignment or license, the court will regard such contract as having been carried out for the purpose of determining whether or not the assignee or licensee is a necessary party either as sole or joint complainant.

2. SAME — CONVEYANCE BY PATENTEE—ASSIGNMENT OR LICENSE.

A conveyance by a patentee to another of the sole and exclusive right and license to use and to build for use within territory described the machines of the patent, with certain express exceptions, and also reserving to the patentee the right to build machines in said territory for use outside thereof, is a mere license, and not an assignment, and the grantee cannot maintain a suit for infringement of the patent in his own name, unless against the patentee, nor is he a necessary party to such a suit in equity by the patentee, although he is a proper party if his interests will be affected by the decree, and on seasonable objection by the defendant may be made a party in the discretion of the court.

KAISER et al. v. BORTEL et al.

(Circuit Court, N. D. New York. July 28, 1908. 162 F. R. p. 902.)

PATENTS— SUIT FOR INFRINGEMENT—MISJOINDER OF PARTIES OR CAUSES.

Joint owners of one patent, one of whom is also sole owner of another patent, cannot join in a suit in equity for the infringement of both, although it is alleged that the devices of the two are capable of conjoint use and are so used by complainants, and that defendants jointly infringe both patents, where it is not alleged that they make, vend, or use any single device which infringes both.

TRUAX v. GEORGE F. CHILDS ADJUSTABLE PARLOR CHAIR CO. et al.

(Circuit Court, N. D. Illinois, N. D. March 5, 1894. 162 F. R. p. 907.)

1. PATENTS—ANTICIPATION.

Devices and publications leading up to, but not fully accomplishing, a desired end, do not anticipate an invention which for the first time effectively meets all requirements and successfully accomplishes such end.

2. SAME—INFRINGEMENT—SURGICAL PUMP.

The Allen patent, No. 424,944, for a surgical pump for use in the transfusion of blood and for similar purposes, in which it is necessary that the flow of the liquid as to volume and speed should be subject to the most delicate and exact control by the operator, was not anticipated and discloses invention; also held infringed.

NORTHWESTERN CONSOL. MILLING CO. v. MAUSER & CRESSMAN.

(Circuit Court, E. D. Pennsylvania. July 31, 1908. 162 F. R. p. 1004)

TRADE-MARKS & TRADE-NAMES—INFRINGEMENT—"CERESOTA" AS NAME OF FLOUR.

The words "Ceresota," as the name of a brand of flour, is not descriptive in such sense that it may not be adopted as a valid trade-mark, and such trade-mark is clearly infringed by the use of the name "Cressota" by a different manufacturer.

HUTCHINSON, PIERCE & CO. v. LOEWY.

(Circuit Court of Appeals, Second Circuit. May 5, 1908. 163 F. R. p. 42.)

1. TRADE-MARKS AND TRADE-NAMES — INFRINGEMENT—INJUNCTION.

The owner of a technical trade-mark is entitled to an injunction to restrain its infringement, regardless of the intention of the infringer or the consequences of the infringement.

2. SAME.

A case of technical infringement of a registered trade-mark held not made out where the trade-mark of defeudant was not identical with complainant's nor so like it as to be readily taken for it.

ORR & LOCKETT HARDWARE CO. v. MURRAY.

(Circuit Court of Appeals, Seventh Circuit. January 21, 1908. Rehearing Denied May 6, 1908. 163 F. R. p. 54.)

PATENTS — INFRINGEMENTS — PROFITS RECOVERABLE—STORE LADDERS.

The Murray patent, 442,531, for a store service ladder, is for an entirely new article, and the patentee is entitled to recover from an infringer the entire net profits made by the latter on the infringing ladders, in the absence of proof that some portion of such profits was the result of something else than the patented device.

POTTOFF et al. v. HANSON & VAN WINKLE CO.

(Circuit Court, D. New Jersey June 6, 1907. 163 F. R. p. 56.)

PATENTS—INFRINGEMENT—BATH AND PROCESS FOR COATING METALS.

The Alexander reissue patent, No. 11,624 (original No. 563,723), for au electrolytic bath for coating metals and a process of galvanically coating metals subjected to rapid oxidation, can only be sustained as involving invention by giving the claims a literal construction, and, as so construed, it is not infringed by the use of a bath which contains no basic salts of the plating metal, such as are specified in the patent as constituting the essence of the invention, but which, on the contrary, is maintained in an acid state, and is composed in part of different ingredients is prepared differently and under different couditions, and whose ingredients, where the same, are in different proportions.

MECHANICAL INVENTIONS AND DESIGNS.

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

George F. Bell, Sistersville, W. Va. Two patents.—The first patent covers an oil well pump, in which a spring actuates the plunger on the down stroke, and which is equipped with means adapted to detachably anchor the reciprocating parts within an oil well tube, and enabling all the apparatus to be easily and quickly removed from the oil well tube when desired.

The second patent relates to a vehicle tongue support, adapted to be readily applied to a wagon or similar vehicle without perforating or otherwise weakening the tongue, and constructed to form a support for the same to relieve the necks of the draft animals of the weight of a heavy pole or tongue.

John H. Burhop, Hot Springs, Ark. Mowing Machine—An object of this invention is to provide a mowing machine, equipped with a rotary knife or cutter, adapted to cut hay and grass more rapidly and with less power than an ordinary reciprocatable cutter bar, and capable of being readily tilted for arranging its engaging or cutting portion at the desired elevation to cut hay and grass the proper length.

Louis Arnavat and Antonio Mendez, Tampa, Fla., J. B. Fernandez, Ybor, Fla., inventors; Joaquim Riera, Ybor, Fla., assignee. Non Refillable Bottle. An object of this invention is to enable a non-refillable bottle to be constructed entirely of glass and to be sealed with an ordinary cork or stopper and to equip it with means adapted, after it has received its original contents, to prevent a liquid from being introduced into it, whereby adulteration and fraudulent refilling is prevented, and also to enable the parts to be quickly assembled after the bottle has been filled.

John F. Brown, Florence, Ala. Ash Pan for Locomotives.—An object of this invention is to construct an ash pan with a slidable bottom designed for use on locomotives with four, six or eight driving wheels, and which will avoid the accidents resulting from going beneath locomotives for cleaning the ash pans, and will save time and labor in cleaning the ash pans, and which will not interfere with the draft of the locomotive.

Howard H. Haas, Port Carbon, Pa. Adjustable Clothes Prop.—This invention has for its object to provide a clothes prop, equipped with an adjustable or extensible section, adapted to be readily raised and lowered, and provided with means for enabling it to be quickly and securely locked at any adjustment, and which will permit the adjustable section to slide freely, and capable also of gripping the same without injuring the adjustable section.

Frank Feazell and Henry Thompson, Winnfield, La. Sprinting Spring.—The object of the present invention is to provide a sprinting spring to be applied to the foot, designed for use in running, jumping, vaulting and various other athletic sports and gymnastic exercises, and adapted to afford great spring power for assisting the movement of the body in such sports and exercises.

Elmer F. Hutchins and Jacob J. Sala, Loval, Wisc. Rural Mail Carrier's Box.—It is the aim of the present invention to provide for rural mail carriers a box or case, adapted for general use as a file box or case, and capable of facilitating and expediting the handling of mail matter, said box being designed to be mounted on a suitable support within a buggy or other vehicle, and enabling mail to be quickly packed and held in a perpendicular position, and capable of being quickly removed and conveniently carried in the hand while depositing the mail in the stationary mail boxes along the route.

John Koontz, Paducah, Ky., inventor: James Weille, same place, assignee. Self Soaping Wash Board. An object of this invention is to provide a wash board, having means for holding a quantity of soap to be applied to the clothes while the same are being moved over the rubbing surface during the operation of washing, and this without unnecessary waste of soap.

Jesse H. Johnson, Kansas City, Kan. Corn Harvester.—An object of the present invention is to provide a corn harvester, designed for shucking corn in the field, and adapted to operate on a row of standing corn, and capable of cutting the same and of snapping the ears from the stalks and of removing the husks from the ears, and finally delivering the latter to a wagon driven at the side of the machine. To this end the corn harvester is equipped with combined snapping and husking rolls, provided with spaced stalk-receiving front portions to snap the ears from the stalks, and contiguous rear portions for removing the husks from the ears.

George W. Ketteringham, Natchez, Miss. Bolt and Nut Lock.—An object of the present invention is to produce a bolt and nut lock, designed for use on railroads, automobiles and various other machinery, and adapted to be readily applied to a bolt and nut by unskilled labor, and capable of securely locking the nut on the bolt, and yet enabling the nut to be readily unlocked and removed from the bolt without injury to either of such parts.

Elmos Lee, Paducah, Ky. Brake Shoe for Locomotives.—It is the object of the present invention to provide a brake shoe having fastening means, adapted to hold the brake shoe on the brake head until the shoe is entirely worn out, and capable of effectually preventing the brake shoe from shaking off the brake head and becoming lost, at the same time permitting the shoe to be instantly removed from the brake head and to be easily and quickly replaced thereon.

Guy N. McGonegal, Juniata, Neb. Veterinary Obstetrical Forceps—It is the aim of the present invention to provide a surgical instrument in which none of the operating mechanism will be arranged exteriorly of the instrument, so that the latter will present a smooth exterior and not injure either the animal or its mother, and which may be readily operated to open and close it, and which when adjusted will not accidentally slip.

Florian J. Martin, Milwaukee, Wis. Back Scratcher.—An object of the present invention is to provide a back scratcher, adapted to find its way readily down the spine of a person without difficulty, even when the collar and clothes are comparatively tight, and capable of enabling the back to be thoroughly scratched in a cleanly and healthy manner, a suitable provision being made to permit the flesh-engaging means to be readily changed to render the device perfectly sanitary.

Joseph H. Lohr, Houstontown, Pa. Combined Washing and Wringing Machine.—It is the aim of the present invention to provide a washing machine, capable of thoroughly washing clothes without tearing or otherwise injuring them, or rubbing the buttons from the garments, and adapted after the rubbing operation has been completed to be readily arranged to form a wringer for expelling the water from the clothes.

Bennett F. Lewis, Longview, Texas, inventor: Longview Crate and Wooden Ware Mfg. Co., Longview, Texas, assignee. Collapsible Crate.—The present invention has for its object to provide a collapsible crate of simple and durable construction, designed for shipping berries and various other kinds of merchandise, and capable of being folded to arrange it compactly for returning it to the original shipper.

Shelby Hicks, Providence, Ky. Journal Box.—An object of the present invention is to produce a journal box, designed particularly for use in connection with high speed and other shafts and journals, and adapted to contain a considerable quantity of oil, so that a shaft or journal will require but little attention to maintain it in a thoroughly lubricated condition, means being provided to prevent any waste of oil, and also excluding dust and grit from the bearing.

Walter S. Peacock, Selma, Cal. Collar Stiffener for Negligee Shirts.—The object of the present invention is to provide a negligee shirt having a stiffener adapted to preserve the shape of a soft or loose flowing collar, and prevent the same from lying flat or rolling down, which would permit the collar of a coat to come in contact with the neck of the wearer, and either soil the coat collar or annoy the person wearing the same. It is also the purpose of the present invention to provide a flexible and elastic collar stiffener, adapted to yield to the neck of a person, and capable of being readily detached to enable the shirt to be easily laundered.

Montieville M. Edwards, Vista, Tex. Cotton Seed Separator.—An object of this invention is to provide an efficient machine, adapted for sifting and separating cotton seed to enable the large and small seed to be sold or otherwise disposed of separately, whereby the value of the seed is greatly enhanced, said machine being constructed to be operated by the wind, and capable of being readily moved from one place to another, so as to be operated in-doors by hand or other power, when the weather is not suitable for operating the machine outdoors.

Oran N. Staley, Hastings, Nebr. Plate Glass Lifter.—One of the objects of the present invention is to provide a device for enabling heavy plates of glass and other material to be easily and conveniently handled, when the plates are in the boxes in which they are to be shipped, and when removing the same therefrom and also when setting the plates in position for use, said device enabling a plate glass to be easily handled without breaking the same or cutting a person handling the glass, and arranged to permit either two or four men to lift or otherwise handle a plate of glass.

Lincoln H. Millen and James A. Smethers, Beatrice, Neb. Two Row Cultivator.—An object of the invention is to provide a two row cultivator, equipped with means for enabling the plow beams to be raised and lowered both simultaneously and independently to throw the cultivator into and out of operation, and also to position the cultivating devices properly with relation to the character of the ground and to the condition of the soil. Another object of the invention is to provide means for enabling the plow beams to be readily adjusted laterally of the cultivator to arrange them to suit the various widths of rows of corn. Another object of the invention is to provide means for enabling the cultivator to be readily guided either to the right or the left to avoid hills or ruts, and to overcome the side draft or strain resulting from the unevenness of the ground.

Gilbert Prarie, Adrian, Mich. Fence Tie.—The present invention has for its object to provide a strong fence tie of a peculiar construction, designed to be made by the dies of a wire fence machine, enabling the vertical stay wire to be securely fastened to the horizontal line wires of a fence and to be rapidly applied to the same.

Thomas Parker, Altoona, Ala., inventor; Jasper N. Rickles, same place, assignee. Wheel Locking Attachment for Tram Cars.—It is the aim of the present invention to provide a wheel locking device for tram cars, adapted to be readily applied to a car or similar vehicle, and capable when tripped, of automatically engaging the wheels and of locking the same against rotary movement for braking the car, when descending a grade or incline, the wheel locking attachment being readily disengaged from the wheels of a car, and reset when desired.

Wm. T. Shoemaker, Philadelphia, Pa. Trousers Stretcher.—This invention has for its object to provide a simple and efficient device for stretching and pressing trousers, and adapted to enable a pair of trousers to be quickly stretched and pressed without liability of tearing or otherwise injuring the fabric, the device being capable of operation by any unskilled person.

William B. Spencer, Chicago, Ill. Postage Stamp and Label Affixer.—An object of this invention is to provide a device designed for affixing postage stamps, labels and similar gummed articles to moistened surfaces, and adapted to enable stamps and labels to be positively affixed with a minimum amount of pressure, provision being made to effectually prevent stamps or labels from becoming displaced in the holder or carrier, when relieved of the pressure incident to applying one of them to the moistened surface.

Samuel W. Salmon, Mineral Point, Wisc. Automatic Draft Regulator.—The present invention, which is designed for use on force draft engines and boilers, is adapted to maintain automatically an even draft, whereby a saving of both fuel and water is effected; and also designed to provide an automatic draft regulator, to relieve the cylinder of back pressure, and capable when a traction engine is passing between stacks, or other points where there is danger of fire, of enabling the smoke stack to be relieved of the entire exhaust, whereby an engine is prevented from throwing out any sparks.

Edward Toussaint, Jacksonville, Ill. Roller Awning.—An object of this invention is to provide an awning, adapted to be rolled up more rapidly and uniformly than heretofore, and capable of being quickly unrolled, and to arrange the roller so that it will be maintained in a dry condition and thereby prevented from warping, and also to arrange the roller operating ropes out of contact with the canvas, or other fabric of the awning, so that the same will not be cut or worn by the ropes when raising or lowering the awning.

John Strang, Quebec City, Canada. Dials for Watches and Clocks.—An object of the present invention is to provide a dial for watches and clocks, adapted to enable the time in minutes and hours to be ascertained at night, without striking a light, or at any time even by a blind person without confusion and without interfering with the second hand of the watch.

NEW PATENTS FOR SALE.

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FOR SALE—Patent No. 934,259. Oil can. Will come into universal use. Very cheap to make and effective in use. Will oil every time and no excess of oil to soil machinery or fabric. Address, H. J. Allen, 2310 E. Beach St., Biloxi, Miss. jan

FOR SALE—Patent No. 902,746, issued Nov. 3, 1908. Self-fastening Hook-and-Eye; no sewing, quickly attached, can be used wherever ordinary hooks-and-eyes are used, cheap to manufacture. Will sell for $800. Address, Harriet N. Legan, 677 South Pennsylvania Street, Denver, Colorado. dec

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FOR SALE—Patent No. 926,360, dated June 29, 1909. Egg Beater. Works perfectly, beating the white and yelk separately at the same time. Wish to have it manufactured on royalty or will sell part interest. Address, Mrs. Fannie H. Speer, Cornelia. Georgia. nov

FOR SALE—Patent No. 899,489, dated Sept. 22, 1908. Pick Ax Guard. A device that is much needed in rock work and coal mines. Saves the handle from wearing out and keeps it solid in eye of pick. A simple working device. Cannot be a better one invented. Would like to hear from any one who buys patents. Address, T. W. Gordon, East Franklin, Maine. feb '10

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FOR SALE—Patent No. 923,166, issued June 1, 1909. Skirt Maker. Outright or on royalty. Let me send you cut or make me an offer. Miss Delia Goodale, 128 Remington St., Fort Collins, Colo. dec

FOR SALE—Patent No. 924,514, dated June 8, 1909. This is a great money saving device for railroads. No more batted joints. Will greatly increase the life of rails. Will sell outright or on royalty basis. Address, John Warchock, Box 43, Seney, Mich. feb '10

FOR SALE—Patent No. 901,124, dated Oct. 13, 1908. Air agitating device for valve-bearing solutions, or any solution requiring constant agitation. For full particulars address, Thomas A. Ross, Selby, Contra Costa Co., Cal. nov 09

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FOR SALE—Patent No. 901,917, outright. A very valuable and useful crib made of wood. Can be manufactured very cheaply. Address, Theodore Kreisel, Warrenton, Va. dec

FOR SALE—Patent No. 908,742, dated Nov. 10, 1908. Dividing board for mowing machines. If stump or any obstruction is struck it folds toward machine and unfolds when machine starts forward. If sold soon will take $2,500, or might sell state rights or sell to manufacturer on royalty. Address, Ralph Loving, Powell, Wyo. nov

FOR SALE—Patent No. 918,149, dated April 13, 1909. Hoof pad, for soaking horses hoofs. Has pad for bottom of hoof and pad for front of hoof. Will sell patent outright for $1,000. Just what the veterinary surgeon needs. Address, William Heathermon, Kneeland, Wisconsin. nov

WANTED.

WANTED—To place on a royalty patent No. 928,101, issued July 13, 1909. Improvements in handles for cooking utensils. R. R. Brakeman, 316 Kirkland St., Palatka, Fla. dec

WANTED—Owner of Patent No. 896,133, is arranging Mfg. Co., and wants others having small patented articles or ideas to join him, with a view of placing our own inventions on the market. Address, Mayer Mfg. Enterprise, Minneapolis, Minn. dec

WANTED—A company to buy or manufacture on royalty patent No. 884,672, apparatus for sharpening lawn mowers. A good seller wherever grass grows and lawn mowers are used. Address, H. E. W. Loomis, Dumont, Iowa. nov

WANTED—A manufacturer to make and put on the market on royalty the best patented combination padlock ever invented. Address, James N. Mills, 401 Flowers Ave., Pittsburg, Pa.

WANTED—We are open to consider anything good in vending machines or real live small novelties, Address, The Automatic Vending Co. Limited, London, Canada. nov

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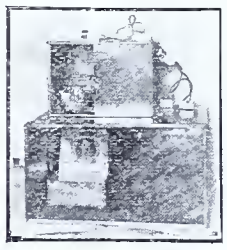
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Taking False Oath to Applications: Perjury.

When it is remembered that a large increase in the issue of patents is recorded every year, it is surprising to note that it is only recently that a decision has been made against false swearing in connection therewith. This was rendered by a judge of the United States district court of the district of Oregon, and it declared that the taking of a false oath in an application for patent made the affiant guilty of perjury. This unique case was entitled "The United States of America vs. Patterson," and the decision was published in August, 1909. The finding was based upon section 5392 of the Revised Statues of the United States, which provides that every person who, having taken an oath before a competent tribunal, officer, etc., that he will testify, declare, depose, or certify truly, and that any written testimony, declaration. deposition or certification by him subscribed is true, wilfully and contrary to the oath states or subscribes any material matter which he does not believe to be true, is guilty of perjury. It was alleged in the finding that the defendant took an oath before a notary public to the effect that "he verily believes himself to be the original, first and sole inventor of the improvement in buckles described and claimed in the annexed specification" whereas in truth and in fact, the affiant when he so swore and made his said declaration and affidavit, well knew that he was not the original, first and sole inventor of said improvement in buckles.

The oath was taken in an application for patent, which application, it should be noted, might properly have been considered an inquiry before the Commissioner of Patents as to whether or not a patent should have been issued for an improvement in buckles to Patterson, the applicant. As the Court remarked, the subscribing of the oath in question was the production of matter material to the inquiry, and a false oath taken in reference thereto would bring the case within the intention of section 5392 of the Revised Statutes. The Court therefore ruled that the execution of the oath by Patterson, that he was the original, first and sole inventor of the improvement in buckles, when the evidence showed not only that he was not said first inventor, but that he knew he was not, rendered him guilty of perjury; and he was accordingly sentenced to serve 13 mouths in the United States penitentiary at McNeil's Island.

If this judicial action is a precedent of future decisions, the Courts will become of great assistance to the Patent Office, and honest inventors will be protected in their rights. We have not the slightest doubt that hardly a day passes in the Patent Office, without the filing of an application for patent in which some one makes oath that he is the original, first and sole inventor of the device described, when he knows he is not. The penitentiaries would be full if all the guilty affiants were punished like Patterson. By one of those inconsistencies of practice which so hamper its action, the Patent Office has no jurisdiction over this question. The responsibility of protecting from fraudulent affidavits not only this tribunal, but worthy applicants for patent throughout the land, rests with the courts. A few such instances as the one cited will doubtless have a salutary effect in purifying the records. In interference cases especially, when the rights of two conflicting applicants for patent are being determined, perjury is found to be widespread. Both the Patent Office and the Court of Appeals have repeatedly referred to the fact that according to the testimony, one of the parties must have sworn falsely. But no action has ever been taken in such cases, and the instance cited is the first one that we know of, wherein a person was found guilty and sentenced for uttering a false oath in a patent application. This precedent should serve as a warning to those who are inclined to view lightly the taking of an affidavit in connection with an application for patent. As long as this decision stands, it may be regarded as the law, and we see no reason why it should not be followed in other jurisdictions. It certainly ought to be the law that a false affidavit in a patent application should constitute the crime of perjury, for in this way the Patent Office can be safeguarded in the performance of its duty of awarding the patent to the man who really is the original inventor, while on the other hand the latter obtains the protection to which he is rightfully entitled.

To keep themselves posted in the progress of the arts in which they are interested, inventors and manufacturers should subscribe for the INVENTIVE AGE, which publishes a list of all patents issued each month. The low subscription price and the character of the publication, entitle it to the support of all the inventors of the country.

Important Patent Convention With Germany.

It has been the custom, in the patent practice of Germany, to require the working of a patent within three years from the date of the issue of patent. The working of a patent—a term familiar to all residents of Europe, but strange to our ears—means simply that the inventor should put the invention into practice within the country. For instance, if his device is a typewriting machine, he would have to make a machine, or as many as was necessary to supply the demand; and it is regarded as a valid defence in a suit for infringement, to state that a patentee has failed to work his patent, or to supply the market demand. Many a German patent has been declared invalid on this ground. Nearly all the governments of Europe have such legal provisions, and the United States is perhaps the only civilized country in the world in which no such requirement is made. Foreigners who take out patents here have not been required to work their patents, and it necessarily followed that they had a distinct advantage over U. S. patentees who sought foreign protection. To remedy this, attempts have been made from time to time to provide reciprocal arrangements in the shape of treaties or conventions, whereby United States patentees would be exempted from the onerous necessity of working their inventions in foreign countries. Germany is the first country to respond to the overtures on our part. The convention recently made with the Fatherland provides that the working of a patent in the territory of one of the contracting parties shall be considered as equivalent to its working in the territory of the other party. That is, if the machine is manufactured in the United States and exported therefrom to Germany, the law is complied with; a very satisfactory arrangement for American inventors, and a just one, since this government requires no more of German patentees. The agreement, which is in every respect a measure of reciprocity, covers future contingencies. It states that the provisions of the laws applicable, now existing or hereafter to be enacted of either of the contracting parties, under which the non-working of the patent, working pattern, design or model carries the invalidation or some other restriction of the right, shall only be applied to the patent, working patterns, designs or model enjoyed by the citizens of the other contracting party within the limits of the restrictions imposed by the said party upon its own citizens.

The operation of this law is a matter of considerable importance, since it makes a German patent more valuable. Not being required to work the invention in that country within a specified period, a patentee may take his time in exploiting it. We expect to see an increased demand for German patents in the near future, for in many respects Germany is an excellent country in which to obtain protection. When its office grants a patent, it generally relates to an invention of some consequence. It is so well recognized abroad that the examinations in the German office are thorough and strict, and the decisions fair, that the final grant of a patent is regarded as a guarantee of patentability, and other countries are willing to take the same action.

American Exposition Abroad.

An exposition of American products is to be held next summer in Berlin, the special object of which is to educate the German population to the importance and excellence of our manufactures. The exposition will be widely advertised throughout the Empire, and every effort will be made to popularize and exploit American goods in that market. Berlin is an ideal exposition city, constituting as it does the commercial and intellectual center of Eastern Europe. It has a population of two and a half million, and the number of visitors in the city is estimated at 150,000 monthly. There is always a large influx of strangers during the summer, as there are constantly attractions about the capital. The exposition will be held in the Exposition Palace, where some sort of exhibit is almost always taking place—automobile, naval, agricultural, etc. It is a massive stone and steel structure, with a floor space about twice that of Madison Square Garden. Special inducements are being offered American firms to display their products. The price of space per square foot will include all incidental expenses. Exhibits will be insured at the rate of $25 per foot. The Hamburg-American Line and North German Lloyd Line have granted a reduction of 20 per cent in the freight charges on shipments both ways. Exhibits may be sold after payment of customs duties. Awards will be bestowed by a jury of prominent Americans.

Fog Signals.

A correspondent from Michigan writes to the INVENTIVE AGE suggesting that collisions of vessels in fogs at sea might be avoided by the general adoption of a system of signals, according to the following code. The compass is to be divided according to the four main points, each main division further sub-divided. The fog horn is to blow according to the divisions, one prolonged blast being intended to indicate north, two east, three south and four west, the sub-divisions being shown by short blasts. A vessel steering E.N.E., for example, would give one prolonged blast, for north, and three short ones, denoting three points to the right of north. A vessel going W.S.W., would give three prolonged and three short blasts. In this way, when ships are groping in fogs and hear the signals of other boats, they can form an idea of the direction from which the danger

is approaching. Sound, it has been found, is the only sure method of transmitting signals through fog, as even the strongest search lights are powerless to penetrate the smothering vapor. The universal equipment of vessels with wireless telegraph apparatus will go a long way toward insuring safety in ocean travel, but it does no harm to multiply precautions, and to use all possible devices to protect the lives of those who go down to the sea in ships. In case the wireless apparatus should become disabled or through some external circumstance should fail to work, or if it should be beyond the range of other stations, this simple system of signalling, says our correspondent, might be found of great value. The collision of the Republic and the Florida, and of the German yacht Hohenzollern with the Norwegian steamer, and hundreds of other ocean casualties would have been averted had each vessel been able to locate the other.

Machine Made Sidewalks.

Sidewalks are now being made by machinery, an apparatus which is composed essentially of a traveling mold and a winch for pulling it along having been employed in some of our municipalities in the construction of cement pavements. The concrete which forms the foundation for the sidewalk is dumped into the front part of the mold, and the finishing mortar is fed into a hopper in the middle. This hopper is so designed that it feeds a thin layer of mortar onto the concrete base as the mold travels forward. Thus a complete and perfect sidewalk is delivered at the rear end of the machine.

With a properly organized gang, the mold is kept traveling continuously at the rate of 2 feet per minute. The shape of the mold is such that the concrete is squeezed both laterally and vertically into a dense block, which requires no ramming. The finish is claimed to be perfect.

Indirect Illumination.

The method of illumination in which the light source is concealed, and depends upon reflection from walls or ceiling for the proper lighting of the room, is growing in favor. It has long been admitted to be by far the most aesthetic form of lighting, but its application has been limited owing to the great loss or absorption of light after leaving its original source before it reaches the working plane. Perhaps the most successful method is that in which the light is hidden behind brackets or cornices around the edge of the room, and the rays reflected toward the ceiling. The tungsten lamp proves an ideal source of light for this indirect system. Around each lamp is a reflector of blown glass, coated on the outside with silver, which is protected by elastic enamel. The reflector is of bell shape and contains circular and vertical corrugations, which cause the light to seem to come from different directions.

Indirect illumination is not only more aesthetic, but enables one to see better. While it is true that there is a loss of light, this is overbalanced by another factor. The more easily details can be seen, the more effective is the illumination. When there is a bright naked lamp in front of the eye, the pupils contract and therefore the eye takes in less light, and things that are illuminated are not seen as clearly as with less light and a wide open pupil. Hence, the fact that there may be less light with indirect illumination does not mean that we see less clearly, but on the contrary, that we really see better. Many are of the opinion that we are suffering nowadays not from under illumination, but from over illumination.

Electric Time Table.

Any one along the line of a particular trolley route naturally knows the running time on that line or the time of day when an electric car is expected to pass a certain spot, but that, generally, is the extent of his knowledge of the schedule of the road. When these same people arrive at the transfer station and wish to know when the next car leaves for some other section, the starter is invariably looked up for the desired information. In one glance at an automatic time table, one can tell the running time of any of the lines for 15 minutes in advance. The time clock runs continually, like any other clock. The sheet upon which the time table is written operates for 18 hours and by the use of a battery system, the clock winds itself continuously.

Each minute of the 18 hours is represented on an endless chain of cards, which revolves through the use of an electric contrivance. There are 15 cards visible at one time, the top card agreeing with the clock and the other 14 showing the schedule for a corresponding number of minutes to come. During the 18 hours of service, there are 1,080 cards displayed on the face of the time table. As the card passes from view at the top, the sheet moves up one, a new card appears at the bottom, and the one which disappears gradually works its way down in the rear of the machine, is folded and put in readiness to appear in its proper turn during the next period of service.

A portion of the space on the cards is used for advertising purposes. The space where no cars are scheduled is used by the railroad during the summer months to advertise the various attractions and places of interest along the line.

Electricity in Coal Mining.

Although there is no likelihood that the services of the hand miner will be dispensed with entirely in the production of bituminous coal, still his work now consists principally of odd jobs. For production on a high tonnage basis, his place has been taken by the electric chain cutting machine. Experiments with various types of cutters led to the development of this machine, which is adapted to almost every condition of coal mining. The machine consists of a rigid base frame, held in place on the floor of the room by jacks. A pan foot under the front jack and rollers resting on a skid at the rear give all the firmness of three-point or tripod support, regardless of floor irregularities.

Fitted to guides on the rigid base is a traveling frame of long triangular form, with an endless chain embracing its three sides, passing around two idle sprockets at the forward end and a driving sprocket at the rear. An electric motor attached to the end of the traveling frame performs the double duty of driving the cutter chain around the frame and of forcing the frame itself, with the chain, continuously forward along the rigid guides. The links of the chain carry inserted cutter bits; some horizontal, others inclined upward and downward. As the traveling frame advances into the coal, these bits make a channel four inches high.

The operator stands at the controller of the motor, and his assistant clears away the cuttings with a shovel. The depth of a cut is determined by the length of the machine, and this again is governed by the character of the coal, nature of environment, etc. When the full depth of the cut is reached, the feed stops automatically, and the machine is backed out and moved to the right a short distance, where the jacks are reset ready for a second run.

Automatic Automobile Gun.

The most effective gun known to the world has just been added to the military equipment of the United States. It can send 300 1-pound shells every minute to the distance of four miles, and can be mounted on an automobile and hurried at the rate of 50 miles an hour to the point where it is most needed. The mounting of guns on automobiles is not new; it has been tried in Europe for years; but the recoil knocks the chassis to pieces after a few rounds. This newest gun has no recoil. The machine can stand the firing as long as necessary, and then can be rushed at express train speed to some other vulnerable place.

The gun is, in effect, a gas engine. Beneath the barrel is a steel chamber which contains a piston rod. When the first projectile is fired it acts as a valve. The gas from the explosion passes through small holes in the barrel and forces the piston backward. The end of the piston rod is attached to a shuttle which throws out the empty shell at the moment of firing and drops a new shell in its place, thus allowing 300 shots a minute to be fired. On the muzzle of the gun is another device—the apparatus which takes the recoil and uses it for putting in another shell, instead of wasting all this energy. This keeps the gun steady; a woman sitting on the carriage could fire a fifteen-pounder without feeling the slightest shock.

All hunters know that the kick of a shot gun makes the shoulder black and blue, and with larger guns it is proportionately deadly. This new gun promises to effect a revolution in ordnance. The absence of recoil will be of special advantage on battleships, as shots can now be fired more rapidly. It is estimated that a 12-inch gun, weighing 80 tons, expels 360,000 tons of waste energy every time it is fired. Much of this waste will be utilized in operating the new device. Its accurate range is further than that of the Springfield rifle, and in addition it is automatic. The shells will penetrate an inch and a half of steel. The apparatus can be worked while the motor is running at the rate of 50 miles an hour, which would make a hard target for the enemy to hit.

The adoption of this gun will in time probably lead to the passing of the stationary fort. Such a fort can defend but a limited area: a dozen of these guns, on the other hand, would constitute a traveling fort, that could be hurried from point to point, covering hundred of miles of territory, inland or on the coast. In addition, its cost is but a fraction that of the modern fortress. It can be made an effective weapon not only against invaders from the sea, but from the air. Although airships as at present constructed cannot cross the ocean, it can be but a question of time when such a feat will be accomplished. The new guns can be fired at any angle, and it would be easy for one gun to put an entire air fleet out of commission. Much attention has been given of late to this possible method of warfare, and experiments have shown that ordinary rifle bullets have little effect upon airships and military balloons. But the one-pound shells fired by the automatic gun would tear any gas bag into pieces in a few minutes, and the moving forts could be rushed to different points of attack to repel the invaders.

Cement on Ships.

When the use of iron, and later of steel became general in shipbuilding, it was soon recognized that some means would have to be found to protect portions of the structure, particularly those in which water gathered, either as the result of drainage or from other causes. The principal portion of an iron or steel ship in which some preservative was first seen to be necessary was the bottom. Portland cement was found to answer the purpose admirably. A writer in the *Engineering Digest* describes the uses to which it is put. The plating and rivet heads, as well as the frame flanges, are practically buried under a thick coating of cement, while the floors, keelsons, etc. are well covered with cement wash, which it has been found effectually protects the iron and steel. Even with the advent of double-bottom vessels, cement has played an important part, the bottom plating, rivet heads, etc. inside the double bottom being treated as above.

Cement is also largely employed in the bilges and water courses. The shell, tankside angles and bracket angles are well covered, the cement making it possible for the water to run freely through the drain holes. Instead of painting the internal parts of water tanks, these are well coated with cement, and the same treatment is given any places where moisture is likely to gather. One of the most important points in favor of cement is its utility in stopping leaks, which might otherwise be a source of serious loss to the shipowner. A vessel that receives injury, say in the fore end—a part of a ship's structure particularly liable to damage—has the spot covered with a few tons of cement, and is then able to make a long journey, and even to carry cargo, without danger, before it reaches its home port and can be permanently repaired.

A CLASSIFIED list of Patents issued during the month appears in each issue of the INVENTIVE AGE. This keeps inventors and manufacturers posted in the art in which they are most interested.—We will send, postpaid, to any address, printed copies of any U. S. patent, with specifications and drawings, upon receipt of 10 cents per copy; twenty copies $1.50.—Please give correct data in ordering.—Address,

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Sign, Illuminating....D. Fernald et al
Sign, Revoluble....A. H. Grove
Signal....J. M. Kennedy et al
Skirt-gage....E. M. Weisell et al
Skirt-length gage....R. W. Tyler
Slicing machine, Fruit....F. E. Caton
Slicing machines, Slice-support for meat....H. Thomas
Smelting-furnace....S. B. Ladd
Snare-curette....F. B. Black
Snow-plow....J. B. Martin
Soap, Toilet cleaning....R. Lyon
Soda-fountains, Automatic syrup delivery for....A. R. Gross
Sofa and bed, Combined....W. J. Fountain
Sole-pressing machine....E. E. Winkley
Sound-box needle-holder....M. A. Possons
Sound-record mold....J. W. Aylsworth
Spark-plug....W. M. Sleaford
pectacle-temple....S. C. Laflin
Spinning-machine attachment, Twine....E. C. Williams
Spiral drill....A. Urbscheit
Spring clamping device....J. A. Mudd
Stanchion, Hog....W. C. Garnett
Stay-bolt....W M. Smith
Steam generator and superheater....C. A. Hammel
Stereoscope....C. H. Graves
Stereotype-casting device....H. A. W. Wood
Stoker, Boiler....J. E. Bell
Storage-bin....G. W. Boll
Street-sweeping vehicle....A. Verschuren
Stud, Separable....H. C. Ward
: urgical stocking or casing....F. W. Smith
Sweeping-machine, Cremating....A. S. Emerson
Switchboard, Automatic....A. and P. Jambor
Switch contact device....J. A. York
Switch mechanism, Electric snap....C. G. Perkins
Switch operating device, Automatic....R. R. Miller
Table lock, Extension....E. Tyden
Table-mat....H. F. Galbraith et al
Tack-pulling machine....L. V. Miller
Talking-machlne sound-modifying means....E. S. Gliver
Tank-heater....S. S. Woodbury
Tanning and depilating hides and skins, Means for....C. J. Glasel
Tap for drawing liquids from casks....M. Lebold et al
Taxameter....C. Hammer
Telegraph-key....J. A. Hulit
Telegraphic apparatus, Morse....G Bogni
Telephone-mouthpiece....G. H. Reed
Telephone system....3 pat....H. G. Webster
Textile material, Guide for....I. E. Palmer
Thermal cut-out, Rechargeable and non-interchangable inclosed....T. A. Miller
Thershing-machine....R. W. Crippen
Tire....W. H. Bachtel
Fire....J. A. Bowden
Tire, Automobile....C. E. La Fleur
Tire, Pneumatic wheel....J. Neff Sr
Tires, cushions, buffers, upholstery, Manufacture of an elastic cellular or spongy material for use as a filling for vehicle....F. Pfleumer
Tobacco-pipe....T. H. Kerins
Tobacco-sizing machine....R. H. Robinson et al
Tongue-switch....C. E. Fink
Tool-holder....J. H. H. Jones
Tools, Manufacturing....G. E. Wood
Toy, Mechanical....W. I. Towne
Track-leveling device....C. E. Warren
Track-surfacing level....O. H. Tolley et al
Traction-engine....F. H. Graham
Tripod....R. Kroedel
Trolley-wheel....F. S. Yoder
Trolley-wire hanger....C. A. Kraynik
Truck....M. M. Dickinson
Truck for harvesters and other machines, Tongue....W. M. Wadleigh
Truss....A. Wakeman
Truss-rod construction and adjusting device....H. J. Gerhardt et al
Turbine....S. T. Holly
Turbine....R. Henderson
Turbine, Elastic-fluid....G. Belluzzo
Turbine, Variable-speed elastic-fluid....G. Belluzzo
Turbo-rotor....A. H. Wouters
Turning-tool....J. T. B. Rheinfeldt
Twine-cutter....J. P. Weisman
Type, Device for justifying lines of....R. Dacheaux
Typewriter....L. J. Odell
Type-writing machine....C. Roderick
Type-writing machine....L. C. Myers
Type-writing machines, Ribbon-oscillator for visible....W. R. Fox
Umbrella-geat....S. S. Fretz
Vacuum-jacket indicator....J. L. Fate
Valve....J. R. Phillips et al
Valve....J. B. Knudsen
Valve, Automatic return....T. Davis
Valve device for plumbing-fixtures....P. J. Madden
Valve, Fluid check....C. W. Lockwood
Valve for air-brakes, Tripple....W. B. Mann
Valve-gear, Rotary....O. O. Lemon
Valve mechanism for gas-engines, Exhaust....F. P. Benson
Valve, Reducing....T. P. Ford
Valve, Stop....J. Koenig
Valved bag....J. Reaney et al
Vanilla, Oleoresin of....E. J. Sheehan
Vehicle....C. F. Schmelz
Vehicle-body....E. H. Remde
Vehicle-brake....W. H. Kirk
Vehicle-canopies, Head and rib for....W. J. Slyder
Vehicle, Motor....L. G. Nilson
Vehicle-spring....J. N. Brewster
Vehicle-spring....F. Berger
Vehicle-wheel, Flexible-rim....J. Corrigan
Vehicles, Brake for the steering-wheels of....T. G. Allen
Vehicles, Device for clearing obstructions from the path of....H. W. Powel et al
Vending-machine coin-chute....J. H. Dean et al
Vending machine, Pencil....A. Wagniere
Wagon, Ammunition....W. Mayer
Wagon, Automatic dump....P. N. Lindskog
Wagon-body....M. C. Bauer
Wagon-brake....W. C. Moors
Waiter, Mecanical....C. C. Pitts
Wall-coping....G. Grenzebach
Wall decoration....G. W. Dunn
Wall-plug....W. V. Heinz
Walls and the like, Rib for....G. B. Waite
Walls, Reinforced construction of....J. T. Flynn
Washboards, Soap-holder for....L. Nussbaum
Washing-machine....W. P. Nash
Water-closet....P. J. Madden
Water-motor....F. W. Johnson
Wave-motor....C. W. Hicks
Wax-extracting apparatus....E. Kopke
Waxing-pad....L. C. Hartsoek
Weighing apparatus....J. Reuther et al
Weight of loads, Means for determining....A. E. Brown
Wheel construction....R. B. Woodworth
Wheeled rake....A. E. Fox
Wind-motor....C. Daub
Windmill-governor....W. A. Fifield
Window....A. Straubhaar
Window-lifting mechanism....L. J. Berg
Window-sill, Metal....C. S. Thorne
Wire and making the same, Iron....J. C. Fraley
Wire-drawing apparatus....J. Stratton et al
Wire-hoop-forming apparatus....A, J. Spieer
Wire-netting, Machine for making....J. Matthews
Wire reels, Automatic mechanism for barb....H. M. Cosey
Wires, Seam for Fourdrinier....A. B. Wiessenborn
Work-box....T. Werstad
Woven fabric....W. Walker
Wringer-roll....R. Schwieder

DESIGNS.

Ckimney-cap....E. C. Wade
Clock case, Chime....J. E. Green
Tool casing, Pneumatice....H. E. Le Gendre

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MECHANICAL PATENTS.

Abnormal potential-discharging and are-disrupting device....F. W. Erickson and F. W. Lord
Acid-making apparatus, Sulfuric-....F. J. Falding
Adding-machine....J. H. Ginet, Jr.
Advertising apparatus....C. F. De Soria
Advertising apparatus for cars, etc....J. Crane, Jr.
Advertising device, Automatic dental....A. Lavallee and G. J. Constantineau
Air-hrake appliance, Safety railway-truck....J. L. Bering
Air-ship....E. S. and W. D. Le Fevre, *et al.*
Albumen and animal case in and the product therefrom, Treating vegetable....F. G. Wiechmann
Alfalfa-cutting machine....D. L. Adelsperger
Ammonia from coal-gases, Recovering . J. Collin
Amusement apparatus....H. N. Ridgway
Annealing-furnace with inlet sealed hy steam....C. C. Baldwin
Antiseptic composition containing phenyl acetate....N. Sulzberger
Apparel apparatus....E. Kasralowicz
Assorting and sizing apparatus....E. W. Johnson
Atomizer....T. A. De Vilbiss
Atomizer for perfumes and other liquids....H. Rachmann
Automatic gate....J. W. Johnson
Automobile carriage....T. J. Van Pelt
Bag-filling machine....J. L. Drohen
Bag-tie....J. M. Stryker
Baggage-records, Manifold-sheet for....W. Leach
Baling-machine....R. A., C. H., and W. Caswell
Ball-carrier....J. T. Cowley
Base-ball....B. F. Shibe
Basket, Folding....W. A. Snyder
Batteries, Container for secondary....E. L. Oppermann
Battery-covering....G. E. Andrews
Bearing, Roller-....J. H. Cook
Bed, Folding....J. Maurer
Bed or couch, Extensible....J. Ludwig
Bed-pan....M. F. Cagle
Bedclothes-clamp....G. W. Bacon
Bedstead-shipping box or crate....S. Rosenthal
Beer dispenser, Root-....F. H. Anderberg
Belt-cleaner....J. A. Bowen
Belting....P. L. Wooster
Billing-sheet, Multiform....E. Z. Lewis
Binder, Loose-leaf....S. H. Mitchell
Blacking machine, Edge-....W. E. Wentzel
Blank-furnace....W. Scrimgeour
Boat for submarine vessels, Life-....H. J. Walles
Boiler....C. E. Chapman
Boiler furnace, Steam-....D. L. Brownfield
Bolting-machine, Centrifugal....G. Cusson
Bottle....G. E. Smith and C. Hamell, *et al.*
Bottle and jar stopper....D. Baxter
Bottle, Non-refillahle....L. Runner, *et al.*
Box-making machine....F. E. Slayter
Bread-cutting machine....G. Jendras
Brick-press....A. and J. Berg
Bridge construction....J. D. Luttrell
Brush....E. Miltner
Brush for screen-doors, Fly-....W. L. Johnson
Brush, Sink-....C. Plunkett
Buckle....F. P. Tenney
Building construction to resist the action of earthquakes....J. A. Calantarients
Burglar-alarm, Explosion....J. K. Rissel
Burner....C. S. Chrisman

Button-blank-distributing-machine attachment...I. De Francisci
Caissons, Shafting for...C. P. Downing
Call-box...H. S. Bullock, Jr.
Camera...W. F. Folmer
Can coating or lacquering machine..J. G. Hodgson
Can lacquering or coating machine..C. S. Bucklin
Canned-goods-sterilizing apparatus...A. Mill
Candle-assembling machine...C. B. Manbeck
Car...J. E. Tesseyman
Car bolster, Hopper-...A. Becker
Car-brake mechanism...C. M. McCarthy
Car-door lock, Freight-...L. Wadsworth
Car-door operator...F. F. Unckrich and C. L. Seeley
Car, Dump-...T. R. McKnight
Car-dumping apparatus...C. H. Wright and H. E. Scott
Car-jacking apparatus, Railway-...C. Ruegg
Car side-bearing and center-bearing testing machine, Railway-...J. F. O'Connor
Car-underframe...J. E. Tesseyman
Car-wheel...R. J. Gardener
Car-ventilating system...D. I. Cooke
Cars and the like, Spare wheel for motor-...F. R. Dennison
Carbureter...C. A. Haas, *et al.*
Carbureter for internal-combustion engines...P. J. Grouvelle and E. H. Arquembourg
Card-exhibiting device...A. J. Thomas
Cart for distributing concrete, etc..N. F. Ambursen
Cash issuing, indicating, and registering apparatus...F. Drobniak and J. Flanecki
Casing...J. E. Gloekler
Caster-wheel...B. C. Mathes
Cattle-guard...B. E. Mosher
Cement, Manufacturing...M. Trembour
Centering-form...C. D. McArthur
Chain...W. H. Trout
Chain ane link therefor...J. T. Corbett
Cheese-cutter...A. De Vilbiss, Jr.
Chuck...H. S. Johnson, *et al.*
Churn...S. Etter
Cigarette-case...J. E. P. Pender
Circuit-breaker...J. B. & H. E. Howe
Circuit making and breaking device..H. S. Baker
Clamp...J. C. Toed
Clevis...L. D. Bell
Clothes-hanger, Folding...M. H. Cazier
Clutch...H. C. La Batt
Clutch, Friction-...N. W. Baechle
Coat, Inflatable...F. F. Hodgkins
Cock, Gas service-...J. T. Brady
Cock, Safety gas-...S. Allen
Coffee or spice mill...A. A. Warner
Coherer...W. W. Massie
Collapsible box...O. A. Paulson
Collar-blanks and the like, Machine for folding...W. L. Dixon
Collar, Shirt-...J. Dorf
Composition...B. Friedlaender
Composition of matter T. D. Lynch and J. J. Crane
Concntrator...J. P. Evans and R. P. Akins
Concrete construction...S. C. Fiddyment
Contact-maker...J. F. Webb, Jr.
Convertlet...C. R. Bold
Conveyer, Hydraulic dirt-...J. E. Haarmann
Cooker, Fruit-...F. C. Roberts
Copper ores, Leaching...G. C. Schneider
Copying-press, Roller...P. H. Yawman
Corn-sheller...L. J. McMillin
Corset...S. E. Covington
Coupling...J. M. Adams, *et al.*
Crane, Traveling...E. E. Brosius
Crate, Egg-...E. E. Ward
Cream-separator-core cleaner...L. L. Stahl
Creel...S. W. Wardwell
Crucible-furnace...W. Scrimgeour, *et al.*
Cuff-holder...L. E. Allen
Culinary tool...A. G. Molnar
Culinary utensil...O. Bagula
Cultivator attachment...T. A. Wylie
Curd-agitator...E. Mandel
Curling-iron heater...H. W. Denhard
Currycomb and brush, Combination..J. Laborde
Curtain-fixture...H. A. Depp
Curtain-hook...M. L. Gould
Curtain-pole...M. Scanlon
Curtain-pole and shade-roller holder..S. A. Dzimian
Cycle frame, Motor-...C. O. Hedstrom
Cylinders, Treating...R. Morrill
Dentist's casting appliance...N. H. Smith
Dikes, Anticipatory riprap-...D. Neale
Door and window lock, Portable...W. Fulton & J. F. Bengert
Door-check...C. D. Wood
Door-closer, Compressed-air...A. E. Hanson
Draft appliance...C. Lunde
Draft attachment, Vehicle...C. V. Paul
Draft-rigging finishing and proving machine, Friction-...J. F. O'Connor
Drawing-board attachment...M. R. Ethell
Drier...F. G. Sargent
Drying and grinding materials, Apparatus for...G. Suter
Drying apparatus...K. Gammel
Drinking-fount, Poultry...C. F. Slifer
Dust-removing apparatus, Dry separator for...R. F. Diserens
Dye, Azo...F. Runkel & M. Herzberg
Dye, Disazo...F. Runkle & M. Herzberg
Ear-muff and neck-protector, Combined..J. Melio
Educational appliance...T. I. Galloway
Electric circuits, Current-interrupter for...F. W. Lord & F. W. Erickson
Electric furnace...J. A. Hay, *et al.*
Electric-light-cord adjuster...O. Dodge
Electric-machine brush, Dynamo-...E. R. Knight
Electric machine, Dynamo-...A. L. Cushman, *et al.*
Electric motor...O. H. & A. F. Pieper
Electric switch, Push-button...L. H. Moulthrop
Electrolier shade- holder...H. A. Torrey
Elevator automatic control device...L. J. Milke
Elevator brushing device...M. B. Goff
Ellipsograph...C. E. Dexter
Engine controller, Gas-...C. L. McHenry
Engine muffler, Explosive-...D. B. Smith
Engine starting device, Automobile and other...A. G. Willard
Envelop, Return-...W. T. Morrison
Envelop, Safety-...W. F. Young
Excavator or dredger...R. Glogner
Extractor...H. Price & A. N. Hood
Eye-shade...G. E. Henry
Eyeglass nose-guard...J. H. Ostrander
Fan for sewing-machines and the like..W. P. Tippit
Farming implement...T. J. King
Fastening-driving machine...L. A. Casgrain
Faucet...M. Bachrach
Feed and water-heater, Boiler-...D. Goff
Feed-regulator...W. Baker
Feed-water heater...J. Pollock
Feed-water purifier...J. Wood, Jr.
Fence-dropper and wire-retaining means...C. Cromwell
Filter...R. J. Goade
Finish, Removing...J. M. Wilson
Fire-escape...H. J. Brackelsberg, *et al.*
Fireman's equipment...L. S. Meikle
Fishing-reel attachment...C. W. Unger
Fluid-pressure-indicating device...T. Sloper
Fluids, Method and apparatus for testing...H. B. Bishop
Flushing apparatus...F. De Alba B,
Flushing apparatus, Water-closet-bowl-...T. J. Murray
Focusing device...W. F. Folmer
Folding bag...W. Rueter
Formaldehyde, Apparatus for producing...W. B. McLaughlin
Foundations, Constructing...J. F. O'Rourke
Friction-rope-drive elevator...E. Boening
Furnace...W. T. Summers
Furnace-charging apparatus...D. Giles
Furnace-oven...F. T. Booth
Furnace-port-cooling means...F. E. Parks
Fuse, Double-acting...J. Harle
Game apparatus...W. H. Cornford
Garment, Combination body-...C. H. Osborn
Garment-protector...R. B. Madill & R. E. Mikesell
Gas apparatus, Acetylene-...L. J. Olson
Gas-lighter...W. D. C. Wright
Gas-meter connection...F. H. Senfelder
Gas-producer...J. R. George
Gathering-machine...F. S. Barnes
Gear-case...T. L. Kennedy
Gearing, Change-speed...L. A. Saussard
Gearing, Changeable-speed...E. A. Johnston
Gold-saving apparatus...V. P. Yelmini
Grain-grinding machine...W. F. & G. J. Moore
Grinder, Cutter-..R. K. Le Blond & W. F. Groene
Grinding-machine...B. H. Davis & C. B. Ross
Guns, Shell-primer for breech-loading..E. M. Funk
Harvester, Beet-...M. J. Ely
Hat-pin holder...W. H. Plane
Hay-holder, Automatic...J. Weddle
Hay-press...T. E. Turner, *et al.*
Hay-rake...W. Winters
Heat-regulator, Electrothermostatic..L. G. Copeman
Heater...P. Schill
Heating-furnace...E. H. Robinson
Heating system and regulator therefor, Water-...C. E. Knickerbocker
Hinge, Separable...J. R. Corbett
Hoe, Weeding or chopping...T. J. King
Hoisting apparatus...C. H. Hartwig
Hoof-pad...R. C. Stewart
Hoof-trimmer...G. M. Bates
Horn article...M. E. & H. E. McDonnell
Hot-water heater...E. B. Sadtler
Husker...J. A. Ramsey
Hydrocarbon-burner and water-feed therefor...E. G. Mummery
Hydrocarbon-engine...E. Troike
Hydromechanical press...A. Wilzin
Ice-cutting machine...J. J. Tobin
Ice-sawing rig...W. F. Smith
Incubator-heaters, Extinguisher for..C. A. Cyphers
Index case, Card-...E. A. Yungel
Indicator...C. W. Snyder
Induction-motor...E. Mattman
Ink, Apparatus for recovery of ingredients of oily...M. S. Hopkins & C. R. Barnett
Insulator for third rails...E. M. Weaver
Insulators, Supporting-pin for...F. A. C. Perrine
Iron, Copperizing...W. G. Clark
Ironing-board...M. R. Geyer
Ironing-board, step-ladder, and bench, Combined...T. Druzbach
Jar cap, Milk-...W. B. Hay
Jar or can closure...A. V. Oldham
Journal-box dust-guard...G. L. Mansfield
Kettle-cover...D. P. Foster
Key-ring...G. J. Kirby
Knife...C. J. Landgren
Knitting-machine...A. W. Redin, *et al.*
Label, Shoe-carton...L. M. Stingily
Ladder, Gymnasium-...M. B. Reach
Lamp-burner...J. H. Dunn
Lamp-chimney holder...L. Hunt
Lamp cut-out, Arc-...L. E. Jones
Lamp, Electric...D. D. Lockwood
Lamp, Electric-arc...J. B. Fournier
Lamp, Incandescent...R. Matheson
Lamp shade-holder, Electric-...G. E. Palmer
Lamp-switch, Electric-...E. A. Lefebre, Jr., & W. I. Miller
Lantern or shade, Collapsible...C. Fleck
Last...A. G. Fitz
Last, Locking-...H. F. Loewer
Lasts, Machine for removing shoes from...F. M. Moody
Latch...H. F. Smith
Lathe-tool...J. D. Ramsey
Lathe, Zinc-...A. E. Johnson
Lathes, Thread-cutting attachment for automatic...J. J. Grant
Lawn-sprinkler...J. C. Kunz
Lens, Solid bifocal...C. W. Conner
Lift, Air-...R. N. Wood
Lighting and heating system, Combined...H. A. Barr
Lime-hydrating apparatus...C. C. Kritzer
Line-spacing mechanism...E. B. Cram
Linotype-machine...W. M. Rapp
Liquid-dispensing apparatus...C. S. Richmann
Liquids containlng mineral value, Separating suspended matter from...P. J. A. Maignen
Liquids from receptacles, Apparatus for recovering...J. Willmann
Lock and latch mechanism...H. G. Voight
Locket...H. E. Adams
Locomotive-ash-pan cleaner...T. Iwanami
Locomotive, Electric...W. F. Hunt
Log-haul...G. N. Gentner
Logging-car bunk...C. W. Russell
Loom, Weft-replenishing...C. Tiberghien
Lubricating compounds, Manufacture of..J. E. Gill
Mail-bag holder...E. S. Shipman
Mail-box...E. W. Easterling
Mail-box flag...F. O. Hess
Mail-carrier, Automatic...P. M. Hacking & A. H. Bastian
Mailing-box...G. Boden
Mailing-tube...F. M. Ashley
Mantle-holder...M. Offenberg
Manure-spreader...D. Garst
Massaging and exercising implement...C. J. Hero
Match-safe...J. T. Smith
Mattress-stuffer...F. Franke
Measuring device, Tailor's...G. S. Tiffany
Measuring machine, Hopper-...A. del Castillo y Romero
Metal bodies, Device for severing...E. Wiss
Metal-severing device...E. Wiss
Metal sheets, Apparatus for bluing..H. E. Sheldon
Metallic compound or composition of matter and making the same...F. A. Headson
Milking-machine...F. H. Schley
Mill...L. E. Gaisser
Mines, Apparatus for removing gases and foul air from...J. C. Stirling
Mold...J. B. Blaw
Mower...E. G. Goodwin
Musical instrument, Self-playing...F. R. Goolman
Nozzle for vacuum-cleaners...J. W. Smith
Nozzle, Lawn-spray...T. Cadwallader
Nozzle, Liquid-...J. G. Mastin
Nut and bolt, Locking...G. W. Poffinbarger
Nut-lock...M. B. Park
Oiling device for stock-dies...F. Thatcher
Ores, Oxidizing...B. E. Eldred
Ornamental pin or badge...C. W. Little
Oscilliameter...H. Shoemaker
Oxids and the like, Reducing and melting..O. Frick
Ozone, Producing...J. F. Place
Package, Rolled...G. J. Fallesen
Packing-machine...T. R. Weyant
Paddy-separator...F. Streckel
Paper and apparatus therefor, Manufacture of...C. Berti
Paper-roll protector...H. B. Pelton
Pattern-carrier...E. H. Mumford
Paving composition, Making and laying..J. H. Amies
Pea-huller...R. W. J. Stewart
Pen, Fountain-...P. D. Corrigan
Pencil-sharpener...E. F. Smith
Perforator...J. F. Jewart
Photographic shutter...P. J. Marks
Piano-action...A. D. Dimick
Piano, Mechanical...N. D. Hosley
Pickle-grading machine...L. L. Barnett
Picture-puzzles, Adjustable frame for assembling..T. G. Strater
Pigment and making the same, Green..F. F. Hunt
Pipe-coupling...J. W. Anderson, *et al.*
Pipe-cutting machine...F. La Vine
Pipe-joint...H. N. Moseley
Plane, Carpenter's...M. M. Beahm
Plane, Sandpapering-...A. May
Planing and sandpapering machine...F. Harbers
Planing device, Meat-block-...D. F. Dempsey
Planing, shaping, or slotting machine with reciprocating strokes of variable lengths..J. H. Wicksteed
Plant-protector...E. R. Drake
Plants and vegetables, Protecting growing...E. R. Drake
Plow and harrow, Combined...W. E. Cartlidge
Pole-support...J. Neff, Jr.
Pole, Wagon-...S. C. Paulson
Portable bin for handling crushed stone, etc...S. F. Welch
Portable house...C. V. Wyckoff
Potato-bug catcher...G. L. Emery
Powder-puff pin...J. Wetzler
Powder receptacles, Attachment for tooth-...J. M. Tobin
Power-producing apparatus...P. Danckwardt
Power-producing process...P. Danckwardt
Power-transmitting device...L. J. Harris
Press for agglomerating combustible briquets...O. Crochet
Pressure elevator, Balanced-...G. F. Steedman
Printing machine, Stencil-...C. L. Burdick
Printing-plate-casting machine...A. H. Cruse
Printing-press...F. H. Van Loozen
Printing-press attachment...T. Martin
Propeller...J. F. Ball
Propellers, Liquid gear for...G. A. Boyden
Pulley...J. T. Voigt
Pump, Double-acting...A. A. Bowser
Pump, Rotary...E. U. Combs
Puzzle...R. D. Clover
Rabble-arm...C. H. Repath
Rail-joint...I. H. Ferree & W. D. Kennedy
Railway block system...W. L. Rummell
Railway frog...J. H. Laney
Railway-rail...H. C. Grant
Railway-rail joint...J. Jordan, *et al.*
Railway-switch...G. E. Lemmon, *et al.*
Railway-switch stand...O. B. Grant
Railway-tariff...A. W. Standing
Railway-tie...H. Hille
Railway-tie and rail-clamp...W. C. Neel
Railway-tie plate...C. W. Jennings
Railway-tie plate and rail-brace...W. H. Tanner
Railway-ties to be used with screw-spikes, Apparatus for preparing...J. W. Kendrick
Railway-train controller, Automatic..L. E. Fugate
Railway-trains, Apparatus for the control of...R. J. White
Rakes, Push-off attachment for sweep-..J. F. Merrell
Razor, Safety-...P. H. Unsinger, *et al.*
Razor strop, Safety-...I. Conrad
Razor-stropping device, Safety-..F. M. Williams
Receiving apparatus...H. Shoemaker
Receptacle, Combination-...F. H. Shaw
Recording device, Labor-cost...J. T. Quigley
Refrigerating apparatus...F. L. Barkdoll
Refrigerating-machine...R. Whitaker
Refrigerating system, Multiple-effect absorption..G. T. Voorhees
Refrigerator drip-cup...A. May
Rerailer...G. C. Headley
Resilient wheel...J. Edman
Respiratory apparatus...J. Tissot
Roaster for coffee and other material...R. Burns
Rolling-hoop...E. F. Draper
Roost, Poultry-...A. J. Baldwin
Rope-socket clamp...J. N. Johnston
Rotary internal-combustion engine..F. W. Goyette
Rotary steam-engine, Reversible...L. Hills
Rotor construction...A. H. Wouters
Roving-frames, etc., Means for cleaning the drawing-rolls of...A. P. Escubos
Ruler, Compass-...J. A. Rydman
Ruling-machine, Automatic...C. U. Brewster
Sacks, Apparatus for automatically filling, weighing, and registering...C. Droz
Sash-weight..G. H. McKinley & S. Steenburgh
Saw-gummer...J. B. Bristow
Saw-moving machine, Band-...J. E. Hibbert
Saw-tooth gage...A. C. Jones
Saw-tooth mold, Diamond-...W. F. Meyers
Saws, Top-jointer for band-...C. J. Brey
Sawmill-carriages, Rotating steam-feed for...C. Shoptaw
Scouring-machine...W. A. Parmenter
Scraper...J. D., H. A., G., J., & L. Zum Brunnen
Seal-lock...I. J. Palmer
Seal-pre-...
Sealing machine, Envelop-...
Seed-drill...
Separator-tank...A. Bowser
Sewer con-truction...J. H. Zinn
Sewing-machine...C. F. Gray
Sewing-machine shuttle...A. G. & R. Will
Sewing-machine trimming mechanism...A. Grieb
Shade-holder...C. N. Wetherell
Sharpening device, Shear-...G. P. Sheffield
Shearing-machine...J. M. Maxwell
Sheet-metal can, Seamless or drawn..G. W. Weber
Shell...G. A. Meinzinger
Ship-repair apparatus...J. H. Reinhardt
Ship's ballast-tank...G. Simpson
Ships or closing holes therein, Means for buoying...J. H. Reinhardt
Shoe-polishing stand...F. A. Johnson
Shoe-scraper...E. R. Thiel
Shoe-support...W. O. Chase
Shovel-board and end-gate, Combined...W. A. Giermann
Shuttle, Pinless...J. H. Devlin
Sieve...W. Williamson & G. Blue
Signaling system, Electrical...F. M. Slough
Silo...E. M. Wilson
Slag-handling apparatus...D. T. Croxton
Sleigh or bob for riding...D. Pelletier
Smelting-furnace, Transforming...H. Helberger
Smoke-preventer, Time-operated...B. L. Ames
Snap...E. A. Benjamin
Soldering-iron, Self-heating...A. Husson
Spade...W. L. Iwan
Spectacle and pince-nez frame...H. P. Frost
Speed-gage...O. D. Munn & J. K. Brachvogel
Speed power transmission, Variable-..L. G. Bayrer
Spike-puller...G. K. Reiley
Spinning-frame attachment, Ring-..A. A. Lovejoy
Sprayer for animals, Disinfectant-...E. Goeke
Spraying apparatus, Portable..D. W. Wadsworth
Spraying-machine...W. D. Knapp
Spring structure, Vehicle-...J. P. Murrey
Stacker...L. M. Blackman
Stairway...J. N. Coleman
Statement-delivery roll...R. W. Gallagher
Stenciling apparatus...O. James
Still, Water-...H. J. Behrnes
Stirrup...F. L. Putney
Stirrup, Safety-...J. C. McClure
Stone composition, Artificial-...B. Hovermann
Stop-motion mechanism, Thread-controlled...C. H. Whitcher
Stove...E. R. Cahoone
Strainer, Liquid-...M. Arruebarrens
Stretcher-support...J. Linxweiler
Stump-burner...W. W. Pope
Stump-puller...S. Chambers
Sugar-holder...J. F. Martter
Suit, Combination-...F. J. Pfiffner
Sunbonnet...N. H. Cuddeback
Switch-hook-controlling device...M. M. Kahn
Synchronizer, Automatic...H. Marshall
Table...A. J. Iwan
Tabulator...E. B. Cram
Tank...C. H. Zwermann
Telephone and telegraph transmitting apparatus..H. Shoemaker
Telephone antiseptic mouthpiece...J. M. Haff
Telephone system...E. R. Brodton
Temperature-regulating system...C. D. Knight & W. O. Lum
Tent...H. J. Saunders
Therapeutic instrument, Electric...C. W. Gaston
Thread-cutter...J. W. Klemm
Threshing-machine...T. S. Haynes
Tie-loader...E. Platter
Tin oxid used for enameling metal ware, Substitute for...R. Weimer
Tire casing, Pneumatic-...J. H. Seiberling
Tires, Detachable rim for pneumatic or other...M. A. Lemercier
Toaster...O. Schellert
Tobacco cartridge and stem, Combined..B. Ziegler
Toilet-seat, Infant's...M. Stein
Tool-centering device...C. E. Kennedy
Tool, Combination-...R. C. Johnson
Toy...A. Gregory
Toy, Figure...B. A. Beal & T. G. Gray, *et al.*
Toy, Oscillating...J. E. L. Larson
Track-raising machine...L. Tanner
Traction-wheel...W. L. Martin
Train orders and messages, Device for handling...S. Kipp
Train-stopping system...J. F. Webb, Jr.
Train-stopping systems, Closed-circuit wiring for automatic...J. F. Webb, Jr.
Transmitting apparatus...H. Shoemaker
Traveler-magazine, Waste-proof...J. R. Grubb
Treadle-governor...J. A. Robison
Trestle, Folding...S. R. Harris
Trolley...N. W. Storer & T. Varney, *et al.*
Trolley for electric vehicles...T. Varney & N. W. Storer, *et al.*
Trolley for electrical vehicles...T. Varney
Trolley-guard...F. V. Polakoskey
Trolley-pole base...C. C. Hale
Trolley-replacer...W. M. Austin & S. C. Cooper
Trolling-hook...A. J. Krantz & G. E. Smith
Trombone...F. Holton
Turbine, Enforced-flow elastic-fluid..W. L. R Emmet
Turbine, Reversible steam-...W. M. Esterling
Turbo-generator, Direct-current...A. H. Wouters
Turn-table, Folding...A. Retz
Twine machine, Grass-...T. W. Jerrems
Type-casting machines, Pot-feeder for..L. A. Sengele
Type-writer, Adding...J. G. Kingsburg
Type-writing machine...C. H. Shepard, *et al.*
Underreamer...J. W. Brackney
Valve...E. A. Reeves, *et al.*
Valve, Automatic drain and check...F. M. Barton
Valve, Combined throttle and trip...H. O. Weldon
Valve, Hydraulic...J. L. & W. P. Brunton
Valve, Pressure-regulating...J. I. Cappon
Valve, Radiator-...F. A. Simonds
Vehicle, Road-...J. Hopper
Vehicle-wheel...W. L. Howard
Vending-machine coin-operated mechanism...A. E. Griffith
Ventilator...E. C. Noe, *et al.*
Vessel-hulls, Construction of...C. Weyher
Violin shoulder-rest...G. Beisheim
Voting-machine...C. A. Benke, *et al.*
Washbench...G. L. Darrow
Washing device...H. J. Behrens
Washing-machine...A. L. Koeneke, *et al.*
Washing-machine-operating mechanism...H. G. Braunlich
Water-closet, Sanitary...S. Smith
Water-elevator...R. J. Meyer
Water-meter...W. H. Sitts

Welding machine, Electric-. . .A. E. Buchenberg
Wells, Heaving-plug for. D. Daniels
Whiffletree, Spring-. F. R. Willson
Windmills, Wind-wheel for. H. M. Wallace
Window-covering. E. Medland & L. E. Capps
Window self-closing device. E. M. Stephens
Window-ventilator. . W. G. Hintz & W. E. Althouse
Wire-handling tool. M. Totten
Wire screen for windows and the like. W. S. Welch & J. D. Mumford
Wire-stretcher. F. Stanlake
Work-support. E. I. La Chapelle
Wrench. A. Serfoza, *et al.*
Yoke and pole-strap connection, Neck-. C. B. Schleicher

DESIGNS.

Automobile hub-cap. G. W. Dunham
Badge. J. W. Green
Dish. C. Bond
Emblem. J. M. Weingaertner
Fringe, Woven. E. Rumpp
Lamp-shade panel. I. Greenwald
Sign. G. E. Moray
Toy ban,. A. C. Williams
Tray or similar article. W. C. Codman
Trimming, Woven. E. Rumpp
Watch or clock dial. L. N. Long

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MECHANICAL PATENTS.

Acetone, Manufacture of. A. L. A. Pages & R. P. T. Duchemin
Adding and number-listing machine. . . . B. Hoskins
Adjustable frame. A. Peticore
Adjustable pattern. M. Bogushefsky
Advertising-machine. J. W. Silver
Aeromotor. S. H. Gilson
Agricultural implement. E. M. Newell
Air, Apparatus for separating oxygen from. J. E. Johnson, Jr.
Air-propeller. H. Otto
Alarm signal, Electric-. H. J. Hovey
Alloy, Antifriction. E. A. Touceda
Amusement and advertising device, Combined. T. Smith
Amusement device. B. Hess
Amusement device, Centrifugal. . . H. N. Ridgway
Ash-handling apparatus. W. H. Smalley & E. Hatton
Axle, Vehicle-. C. T. Cullison
Bag. J. G. Noren
Bag-punching machine, Coin-controlled. A. L. Nevels
Banana-shipping case. F. J. Schmitz
Bank, Registering-. L. Rittelman
Barrel. C. N. Johnson
Basin alarm, Catch-. M. F. Deininger
Bean-separator. C. A. Croel
Bearing, Roller-. O. E. Michaud
Bearing, Thrust-. F. H. Courtney
Beater. B. Hunkler
Bed, Invalid-. F. W. Mitchell
Bed joint, Metal-. J. M. Adams
Bed-spring. A. M. Beymer
Beehive. P. Weaver
Beet-puller. E. A. Smith
Beet-topper. H. R. Arthur
Belt, Abdominal. E. Nickum
Beveling-machine. V. Royle
Binder-post attachment means. . . . R. Krumming
Bit. M. R. Sibbitt
Bit-stock. C. R. Frink
Blue-print washer. H. C. Gawler
Boat. A. Niedringhaus, *et al.*
Boats, Driving-gear for submarine. . F. M. Leavitt
Boiler stand, Range-. C. R. Schmidt
Boiler-tube cleaner. J. Zilliox
Boiler water-gage, Steam-. D. Dahlstedt
Book, Manifold order or sales. L. G. Whitney
Boring-machine. W. T. Sears
Bottle-capping machine. H. S. Brewington
Bottle case or crate W. C. Krause & H. C. Dorn, *et al.*
Bottle-filling machines, Bottle-guide for. . A. F. Zeller
Bottle, Non refillable. J. Burnstein
Bottle-rest for filling-machines. J. H. Champ
Bottle top, Milk-. C. F. Edlund
Bottles and the like, Detachable handle for. A. J. Leh & E. C. Hellick
Bottles, Machine for manufacturing glass. T. W. Simpson
Bottling-machine. J. H. Champ
Bottling-machine, Milk-. G. Strandt & A. H. Niemann
Box. L. J. Merrigan
Box-opener. E. J. Collette, *et al.*
Box press, Fruit-. N. T. Nelson
Boxes for nailing, Machine for holding fruit-. R. T. Woodruff and A. A. Macy
Braiding-machine. R. C. Rahm
Braiding-machine, Sectional. R. C. Rahm
Bread-box. R. W. Jorres
Brick-burning apparatus. W. B. Chapman
Brick, Mechanism for cutting wire-cut. . F. B. Dunn
Broom-holder. H. W. Merrill
Brush and comb, Combination. E. Kohler & J. Bleiker
Brush, Fountain-. A. A. Long
Bucket, Clam-shell. H. E. Huntsbery
Bucket, Collapsible bait-. W. L. Wilson
Building construction. L. K. Davis
Bundle-carrier for binders. I. F. Cole
Bunion-guard. W. H. De Ford
Butter and lard cutter. C. H. Carlson
Butter and milk merging apparatus. . B. N. Hawes
Calculating-machine. C. L. Nelson
Camera attachment. . H. G. Korinko & A. J. Asp
Camera-back. R. Kroedel
Can-cover. B. J. Hartwell
Can top, Tin-. E. Norton
Cans, Manufacturing sheet-metal. E. Norton
Car and heating appliance, Freight-. W. E. Eastman
Car buffer-plate, Railway-. H. Pearson
Car buffer, Railway. P. Recconi
Car, Convertible. M. Rounds
Car-coupling. C. A. Tower
Car door and step operating means combined, Railway-. M. O'Brien
Car draft and buffing gearing, Railway-. E. L. Philipp
Car-roof. B. S. Warren & S. Herbert
Car, Wrecking-. J. W. Dasher
Cars, Connecting-hose for railway-. E. Witzenmann
Carbureted-air appa atus. E. B. Dennie
Cards and the like, Mounting-pocket for. W. Schaake
Carpenter's bench-stop. D. F. Larkin
Carpenter's gage. U. S. Manges
Carrier systems, Transfer mechanism for. . W. Aab
Carton. G. W. Teasdale
Cask-pitching machine. H. Rauch, *et al.*
Caster socket member. D. A. Maccuaig
Chafing-dish. S. Sternau & L. Strassburger
Chance device. A. N. Gitterman
Channel-flap layer. T. F. English
Check-holder. W. O. Roberts
Cheese-manufacturing apparatus. J. Brensike
Chimney-tops, Smoke-stack base for. J. W. Tinstman
Chimney-ventilator. P. Bloom
Chuck. R. C. Helman, *et al.*
Cigar-piercing device. R. C. Holmes
Cigarette-machine. . J. C. Drucklieb & C. Simon
Cigarette-tipping machine. A. L. Boucher
Circuit-controlling mechanism, Time-controlled. F. W. Wood
Clasp. T. C. Luce
Clevis. J. W. Swetnam & C. O. Elam
Closet construction. J. W. Kelly
Clothes-line holder. R. J. Cantrell
Clutch, Friction-. M. S. Slaght & T. J. Kelly
Clutch, Hydraulic. F. De Coligny
Coating mechanism, Surface-. T. W. Kienast
Coating process, Article-. J. M. Talmadge
Coating small metal articles, Metal-. . . E. S. Mowry
Coin-freed automatic machine. H. Hadida
Coke from coke-ovens, Apparatus for conveying. E. Ramsay
Coking-oven. S. B. Sheldon
Collapsible box. D. J. Hudson
Collapsible table. J. W. Lindow
Coloration process. B. D. Avis, Jr.
Combing-machine. J. Southwell
Composition of matter and making the same. W. A. Phillips
Concrete-mixer. H. C. Townsend
Concrete-pile former, Compressible. E. D. Whitney
Concrete-pipe sections, Apparatus for handling. J. C. Mitchell & C. Meriwether
Concrete post. . W. A. Nelson, Jr., & R. L. Appling
Concrete work, Form for. O. E. McMahon
Condenser combined with autotransformer, Electrolytic. E. E. F. Creighton
Conveyor. H. Cory & E. P. Dandridge
Cooker, Fireless. A. Gonella
Cooking apparatus, Electrical. T. M. Caven
Corn holder, Ear-. C. P. Townsend
Corset. I. Yanowsky
Cotton holder, Absorbent-. W. J. Durant
Crate, Folding. T. W. Erb
Crate or binder for tin plates. E. Norton
Cross-head. E. P. Dougherty, C. L. Emerson, & W. A. De Bell
Cross-tie and rail fastener, Metal. A. Ruttan, J. Adams, & C. W. and E. Ruttan
Crustacea, Removing the meaty matter from the shells of. A. Yancey
Culinary device. H. R. French
Curtain-rod support. F. L. Lathrop
Cutter and matcher head. S. Cline
Cutting mechanism. T. W. Kienast
Danger-zone signal for turrets. F. W. Wood
Dart. G. W. Smith
Dental tool. T. Mahoney
Derrick, Oil-well. T. A. Neill
Dessicating and pulverizing apparatus. V. W. Mason, Jr., & G. I. Rochelle
Directory and index, Combined. . . . D. J. Williams
Dish-washing machine. . B. F. Singer & T. Clark
Display-stand. J. Towle
Distribution system. H. L. Van Valkenburg
Door. S. B. Martin, *et al.*
Door and frame, Insect-proof. H. W. Diers
Door-lock. W. Curlett
Door opening and closing mechanism, Sliding-. A. Anderson
Door, wainscoting, etc., Sheet-metal. . C. E. Nellis
Draft and buffing mechanism, Friction. . H. Asper
Draft-rigging, Frictional. C. A. Tower
Drain-board. W. S. Johnson
Draw-bar safety device. B. G. Kitzmiller
Dredges, Swivel and extension connection for suction-pipes of hydraulic. J. W. Sackett
Drill-driver, Portable. T. S. Watson
Drinking-trough. A. Durr
Dust-catcher. J. Kennedy
Dye, Azo. L. Hesse, O. Gunther, & A. Zart
Dynamo-machine construction. B. A. Behrend
Egg-tester. H. Langham *et al.*
Eggs, cream, custards, etc., Beater for. H. C. & O. Preston
Electric call and alarm system. O. O. Baker
Electric controller. T. V. Buckwalter
Electric flasher. D. D. Swem
Electric hoists, Control system for. J. H. Hall & J. F. Schnabel
Electric-light fixture. T. Smith
Electric-light support, Incandescent-. F. D. Powell
Electric machine, Dynamo-. . . A. H. Wouters, *et al.*
Electric switch. H. E. Reeve
Electric transformer-furnace. O. Frick
Electrical apparatus, Wall-cabinet for. H. T. Paiste
Electrolier. J. McGavin
Elevator. B. M. Walpole
End-gate fastener. W. W. Meyer
End-gate, Wagon. B. M. Wilhite
Engine ignition device, Gas-. A. J. Gifford, J. J. Burns & B. S. T. Bishop
Engine plant, Heat-. S. Lake
Engines, Fuel-feeder for internal-combustion. N. McCarty
Engines, Mixing attachment for internal-combustion. J. Illy
Engraving-machine. V. Royle
Envelop. L. Schwartz
Envelop-machine. T. W. Kienast
Equalizer, Three-horse hitch-. N. H. Kellar
Eraser, Rotary. W. R. Gardner
Excavating-machine. G. Holmes
Excavator. R. E. Watson
Exhibitor, Changeable. G. R. Hollingsworth
Explosive. C. Clement & J. Langhard
Extension-table, Pedestal. W. L. Pfefferkorn, A. P. Schloerb, & A. H. Hammetter
Eyeleting-machine. W. F. Lautenschlager
Fabrics, Machine for cutting friction. . L. Atwood
Farm-gate. P. R. Graham
Faucet, Measuring-. M. Koeniges
Feeder, Boiler-. C. A. Jessop
Fence-machine. E. T. Boswell
Fire-escape. J. H. Wray
Firearm. T. C. Johnson
Firearm, Automatic. F. F. Knous
Flaying-knife and the like. J. Coomber
Floor-coverings, Seam-binder for. O. C. Zimmerschied
Flower stand or rack. J. Vogt
Flower-supporter. C. A. Rieman
Flue beader and expander, Combined. T. H. Hayes
Flush-tank. A. D. Williams
Focusing device. R. Kroedel
Folding box. H. L. Gulline
Fowl-catcher. J. F. Luckhard
Freezer. A. Carter
Furnace dust, Manufacture of agglomerated bodies from blast-. W. Schumacher
Furnace dust, Manufacture of coherent bodies from blast-. W. Schumacher
Furnace for the cementation of articles of iron, steel, and alloys of steel. F. Giolitti
Gage. E. D. Keeter
Game apparatus. R. L. Cates
Gang-edger. D. C. Leonard
Garment. H. A. McDonald
Garment, Brassiere. W. J. Reid
Garment supporter and adjuster. . . . G. D. Mackay
Gas-burner. J. O. Shoop
Gas-engine. F. W. Reeves
Gas-generator. G. F. Jaubert
Gas generator Acetylene-. W. A. Woods
Gas-harp, Convertible. F. Heuer
Gas-igniting device. W. Grix
Gas-meter. H. Chrisman
Gas-purifying apparatus. W. McArthur
Gas-scrubber. G. Gray
Gas-storing tan,, Acetylene-. P. C. Avery
Gases, Apparatus for separating mixed. C. J. Fiesse
Gases electrically, Treating. I. Moscieki
Gate. . A. W. Sprague & T. E. Mulroyan, *et al.*
Gearing. W. J. Schoonover
Glass-cutting machine. A. L. Milentz
Glove, mitten, or the like. A. G. Hoegren
Governor or speed-regulator. A. de Dion & G. Bouton
Grab, Safety-. W. Remsnyder
Grading pulverulent materials, Apparatus for. S. Cooper
Grain-bin. G. M. Boll
Gun, Breech-loading gas-actuated. S. N. McClean
Gun-lock. J. Stauber
Gun-sight attachment. H. Korrodi
Hair-comb. J. Swanberg
Harrow. J. Mattern
Hat-baking oven. C. F. Bennett
Hat-fastening, Lady's. J. Morris & S. A. B. Marks
Hat-holder. T. M. Coleman
Hats, Article-holder for. G. Leopold
Hatch-operating mechanism. H. M. Gleason
Head-rest. E. C. Leahy
Headlight. C. L. Betts
Heel-cushion, Pneumatic. W. L. Gordon
Heel-spring. T. Dee
Hinge. J. H. Kaufman
Hoisting mechanism. G. A. Armington
Horse-boot. M. Weiss
Hose nozzle, Garden-. J. G. Kasjens
Hose-rack. H. Gibbs
Hot-air heater. R. L. Short
Hydrant, Reel-operated. W. J. Clay
Hydrocarbon-burner. G. E. Whitney
Ice-shaver. A. M. Preston
Ice-shaving machine. G. S. Blakeslee
Ingot-mold, Automatic-stripping. J. T. Morie & J. Magnanelli
Inhaler. E. Carabias
Internal-combustion rotary engine. W. G. Macomber
Ironing-machine. A. Kreuter
Ironing-table. J. M. Pride & J. D. Davenport
Ironing-table and sleeve-board, Combined folding. T. C. Krings
Jar cap or closure. E. D. Schmitt
Jars and the like, Closure for. A. Scrhram
Keg, Metallic beer-. K. A. Zimmerer
Kettle safety filling device, Tea-. . . . G. T. Bohan
Knife-cleaner. P. H. Lachicott
Knitted fabric, Ribbed. R. W. Scott
Knitting machine, Circular automatic stocking-. J. D. Hemphill
Knotter, Cord-. J. A. Sharp
Lacing-hook-setting machines, Spacing mechanism for. W. F. Fraser
Ladle construction. G. P. Jones
Lamp. F. A. Curtis, *et al.*
Lamp attachment for vehicles. . . . G. S. Sherman
Lamp, Baker's-oven. C. Robson
Lamp-bulbs, Locking device for incandescent-electric-. L. Davis
Lamp, Gas-. A. H. and F. J. Humphrey & R. Wright
Lamp, Incandescent electric. C. Farkas & H. J. Jaeger
Lamp, Inverted. P. B. Johnson
Lamp, Inverted gas arc-. S. W. Hyatt
Lamp, Inverted incandescent gas-. . A. J. Hofmann
Lamp-shade holder. W. V. R. Seltzer
Lamps, Means for igniting and controlling vehicle. A. A. Clark
Lamps, Weatherproof socket for electric-. W. W. Woodbridge
Lap-robe holder. H. F. Tyrell
Last. H. F. Loewer & F. W. Kittlinger
Latch, Automatic switch-. W. S. Weston
Leaf-spring. W. J. Harrison
Leather and making the same, Artificial. L. V. Guilleteau-Chaput
Lens-mounting. W. R. Uhlemann
Letter and document distributor. F. Bristow
Life-saving mattress. H. Schonboe
Lifting-jack. F. L. Gormley
Lights, Head-gear for supporting. . . . D. E. Taylor
Link mesh. W. J. Bailey
Linotype-machine attachment. A. F. Welling
Liquid-selling machine, Automatic. . . . A. Meinert
Liquids from closed receptacles, Device for drawing. G. H. Crease-Williams
Lock and fastener. J. Robertson
Lock and key for same. A. Gogmin
Locomotives, Device for preventing hold-ups on. C. J. Johnson
Log-handling mechanism. C. E. Cleveland
Logging means, Lead-block for. S. J. & P. W. Davis
Loom. H. Le Doux
Loom picker mechanism. B. Trimble
Loom-shuttle. J. Lacroix
Loom, Weft-replenishing. E. H. Ryon, *et al.*
Looms, Spooler for pile-fabric. . . . F. A. Whitmore
Mail-bag-pick-up mechanism. B. R. Simmons
Mail-clip. J. Klein
Mail-house. J. F. Dornfeld
Manure-spreader. D. K. Wilson
Match, Duplex. J. Roche
Match unloading and boxer. E. J. Sterba & J. H. Birch
Mattress-supporter. J. Wilkins
Measuring device, Liquid-. A. Bruce
Metal box. F. O. Buschbaum
Metal-cutting tools, Rolled-metal bar for. E. J. Poole
Metal pieces, Uniting. C. F. Jacobs
Metal, Treating molten. H. W. Partin
Metals or steels of all qualities, Metallurgic process to produce. L. H. Baraduc-Muller
Metal wheel. A. E. Noble
Metallic product. G. F. Allen
Metallic receptacles, Machine for manufacturing. F. Olejniki
Milk-cooler. J. Lindgren & O. A. Mattson
Milking, Device for teaching. P. J. De Vries
Milking-machine. R. Kennedy
Molding-machine. W. E. McCleary
Mowers, Gathering and dropping device for. C. A. Rice
Multiple-effect receiver. G. T. Voorhees
Music-leaf turner. A. H. Osterman
Musical instrument, Double-scale pneumatic. T. Danquard
Mute. K. Fujita
Nursery-chair. P. S. Chandler
Nut device, Lock-. J. S. Conradi, E. Tilston, & P. W. Masson
Nut-lock. C. Starzman
Oil-burner. R. P. Selsor
Operating-table for osteopathic treatment. W. O. Galbreath
Ore-separating machine, Dry-. W. W. Bonson & W. L. McLaughlin
Ore-separating process. M. Ruthenburg
Ore washer and concentrator. A. Dieu
Ores, Treating. A. A. Lockwood & M. R. A. Samuel
Oscillation device. G. W. Pickard
Package. B. G. F. Linnell
Packing box or case. D. J. Cable
Pail holder, Milk-. G. A. Fitch & G. A. Chamberlin
Paint-can. R. Henke, Jr.
Pan-handle, Dish-. C. F. Pfalzgraf
Paper-bottle-making machine. C. F. Jenkins
Paper-cutting machine. G. M. Farnham
Paper-machine pulp-feeding device. . . E. F. Millard
Paper-stock-squeezing rolls. S. R. Wagg
Paper-tube-making machine. S. I. Prescott
Papering machine, Wall-. J. W. Barclay
Paving-block. D. Atherton
Pea-huller. W. L. Hay
Peg-wood sharpener. G. W. Bowers
Pen, Fountain-. T. C. Grant
Penholder. A. M. Gardner
Pencil-holder. C. Platner
Pendulum-escapement, Self-adjusting. W. B. Miller
Perambulator, Folding. O. Kurz
Photographic plates or films for different temperatures, Apparatus for determining relative times of development of. A. Watkins
Piano, Zither-. H. F. Schenuit
Piling, Sectional or sheet. J. M. Rafter
Pipe-casting machine. J. K. Gunn
Pipe coupling, Lead-. G. C. Rick
Pitcher closure, Syrup-. J. C. Noel
Planting-machine. W. F. Ilgenfritz
Plow. J. Buchanan
Plows, Foot-lift for wheeled. M. Gould
Plows, Sweep-brace for. G. M. Wheeler
Pneumatic-despatch apparatus. W. A. Brown
Pneumatic drill. . . M. McCune & J. F. Meloun
Pneumatic-tube switch. E. W. Wallace
Pocket-protector. J. W. Carter
Poison-distributor. P. & H. E. Brandt
Poles and posts, Preserving-shield for. J. A. Cogswell
Potatoes or other vegetables, Apparatus for handling and screening. L. A. Jenkins
Powder-dispensing receptacle. . L. W. De Laurence
Power-transmitter. F. de Coligny
Power-transmitting device. S. Fletcher
Primary battery. W. M. Brodie
Printing-press. E. N. Mills & G. W. Smith
Propeller. T. Amnelius
Pulp-grinder. S. R. Wagg
Pulp-refining engine. F. W. Quantz
Pump, Centrifugal. J. Valk
Pump or apparatus for raising water by means of compressed air, Pneumatic. T. O. Perry
Pump or compressor and the like, Air and gas. W. Scheurmann
Pump, Water-circulating. W. K. Andrew
Pumps, blowers, and the like, Balancing device for centrifugal and similar. W. Scheurmann
Pumping fluids, Method of and apparatus for. O. C. Goeriz
Punch. J. C. Smith
Punching-machine. J. H. Heald, Jr.
Purse. E. Olund
Puzzle-box. B. Guerry
Pyrometer. C. E. Foster
Radiator. F. A. Schlosser
Radiator, Steam or hot-water. W. Kane
Rail-bond-testing apparatus. . . . C. R. Sturdevant
Rail-joint. C. F. Cochran & C. F. Long, *et al.*
Rail-splitting shears. C. E. Macbeth & F. C. Stiening
Rail-tie. J. Griffin
Rails and other metal pieces, Uniting. C. F. Jacobs
Rails, Bonding. C. F. Jacobs
Railway cross-tie. M. L. Townsend
Railway-road-bed construction. C. R. Holden
Railway-switch device. G. F. Weiss
Railway-switch structure. P. K. Dubinsky
Railway-switch-throwing device. W. M. Hiler
Railway systems, Rail for monorail-. . E. P. Dargin
Railway-tie. R. R. Canfield
Railway-tie and rail-grip, Steel. J. C. Platt
Railway-ties, posts, and similar articles, Composition of material for and manufacture of. F. Weckerly
Ram, Hydraulic. P. E. Alger
Range, Cooking-. R. H. Stockton
Razor. C. Mallery
Razor or blade stropping machine. . . . W. J. Kendig
Razor, Safety-. C. R. Faas, *et al.*
Receptacle-closure. T. B. Bradford
Reeling device. E. S. Petersen
Refrigerating apparatus, Safety system for ammonia. F. Hennebohle
Refrigerator. O. M. Campbell, *et al.*
Renovator. J. H. Brown
Resin from rubber, Solution for and method of extracting. C. P. Flora
Revolver. E. Leggett
Rifles and the like, Rod for cleaning. . . J. H. Blair
Ring-cutting tool, Finger-. W. Adelman
Rock-drill. R. A. Fowden
Rock-drills, Self-lubricating air-cock for. . . C. Senn
Rocking-chair, Folding. J. L. Peters
Rolling-mill. J. Fawell
Rotary engine. F. A. Cleveland
Safety-switch. C. M. Parker
Salt-cellar. C. O. Bouvett
Salt, Manufacture of. B. F. McTear
Sand-belt machine. E. J. Jackoboice & R. M. Gleason
Sanding device. O. W. Olsson
Sash-bower. A. Schroeder
Sash-cord holder. J. M. Downham

Sash-holding device, Storm-W. R. Hallam
Sash tightener, Window-P. Forestelle
Scale-car F. K. Hoover & A. J. Mason
Scoop and sifter, Combined A. E. Westburg & G. H. Bates
Scow, Concrete O. F. Lackey
Scow, Self-dumping and automatic bailing G. V. Mitchell
Screen-frames, Angle-brace for G. E. Ferry
Seal R. A. Edgar
Sealing-machine, Bottle-E. J. Godman & W. H. Niemeyer
Sewer system, Odorless J. M. Schofield
Sewing and similar machines, Fabric-supplying device for book- F. Harrington
Sewing-machine grinding-wheel attachment J. N. Moore
Sewing-machine looper mechanism J. P. Weis
Sewing-machine needle and shuttle operating mechanism E. H. Craige
Sewing-machine needle-thread take-up and controlling device F. W. Merrick
Sewing machine, Shoe-F. E. Valois
Sewing-machine shuttle W. Cochran
Sewing-machine thread-controlling mechanism J. P. Weis
Sewing-machines and the like, Motor attachment for C. E. Johnson
Shade and curtain-pole fixture T. Hafer
Shade-roller brac,et J. M. Rhett
Shears, Tension-regulator for G. A. Ritzler
Sherardizing apparatus A. F. Schroeder
Shingle, Composite C. W. Young
Ship-table J. W. Slade & B. F. Downs
Shock-absorbing apparatus M. Houdaille
Shoe-cleaner S. R. Hatfield
Shoe-polisher F. Vaughan
Shoe-trimming machine S. A. Krewson
Shoemaker's repair jack H. F. Marsh
Shovel, spade and like implement T. Norris & E. J. Marshall
Shovels, scoops, etc., Auxiliary handle for F. Hunt
Show-case B. W. Ludeman
Shuttle, Automatically-threading E. S. Stimpson
Shuttles, Quill for narrow-ware F. E. Mellon
Sifter control device A. C. Brantingham
Sifter-top can or vessel G. W. Weber
Sight, Accurate-aim flash-D. H. Mosteller
Sign, Advertising-H. E. Coffin
Signaling and controlling system, Train-despatcher's G. E. Patrick
Signaling apparatus, Electrical O. L. Harrison
Signaling, Submarine J. B. Millet
Signaling system J. G. Nolen
Sleigh-knee H. & H. Wesle
Sleigh-runner for vehicle-wheels J. Karssen
Smoke-consumer S. Hartmann
Smoothing-iron J. A. Meyer
Snap-fastener G. A. McCormack
Snap-hook G. M. Hubbard
Solder for aluminum J. F. Guggenbuhl
Soldering-iron H. Marshall
Sowing machine, Seed-A. Soto
Spark gap and plug, Combination A. L. Ryder
Speed-indicator C. Knopf
Spring block, Vehicle-T. Wright
Stamp-affixing machine D. Carter, *et al.*
Stamping apparatus L. W. Unger
Stanchion, Cattle-J. D. Flack
Steam-boiler W. Kane
Steam-supply to producers, Means for automatically controlling the H. F. Smith
Steam-trap H. Enz & G. Weinschenker
Steel, Manufacture of G. J. Stock
Steel tie O. L. Roberts
Step or platform attachment A. L. Wilson
Stereotype-casting box S. G. Goss
Stitch-making machine, Imitation-J. B. Hadaway
Stony or earthy materials, Apparatus for the treatment of H. E. Rusager
Stoves, Electric igniter for gas-R. Hofmeister
Stuffing-box G. Strance, R. S. Bull, and W. P. Norris
Suit, Girl's combination-S. H. Burket
Swaging-tool R. Schuebel
Switch F. McKnight
Switchboard R. C. Livingston
Swivel W. R. Clarkson
Syringe F. A. Stahl, *et al.*
Syringe-nozzle J. W. Perkins
Talking-machine H. F. Cook
Tank device, Widow's-Cruse P. W. Morris
Telegraph-key F. W. Smith & D. C. Conkling
Telegraph or cable code M. L. Sweeney
Telephone apparatus K. M. Turner & H. W. Haff
Telephone attachment J. B. Burkholder
Telephone supervisory system W. S. Paca
Telephone system C. S. Winston
Telephone trunking system C. S. Winston
Telephones, Memorandum attachment for G. M. Urie
Telpher system B. T. Hitch
Temperature-controlling device W. B. D. Penniman
Thill-coupling, antirattling S. N. Burdsall
Ticket and card case V. H. Pollock
Tie-plate W. L. De Remer
Tie-plate and rail anticreeper, Combined B. R. Scott
Tie-plate washer J. W. Kendrick
Timepiece, Solar H. Hansen
Tire for automobiles and other vehicles, Pneumatic C. A. Lewis
Tire remover and replacer H. M. Owens
Tire-tread C. L. Rempes
Tobacco-pipe A. E. Matson, *et al.*
Tobacco-spearing machine H. Shinn
Tobacco-stemming machine W. D. Doremus
Toggle-lever flask-hinge S. N. Touchman
Toilet C. J. Burkhardt
Toilet composition J. C. Sherman
Tool, Combination-G. H. Waters
Tool, Compound G. T. Hastings
Tool-coupling, Pneumatic A. Hebert
Top, Self-spinning O. E. Frear
Torpedo, Gas-propelled I. N. Lewis
Tower, Transmission-D. R. Scholes
Toy, Mechanical R. E. Cecil
Track hanger, Elevated-H. B. Callander
Traction and lawn-rolling roller H. T. Coldwell
Train-door fastening, Freight-M. C. Devine
Train stop and signal, Automatic W. H. Harris
Tray, Letter-W. W. Worcester
Tree and plant guard and protector W. Lippincott
Tree-protector W. H. Mohr
Trestle, Adjustble and collapsible A. H. Kramer
Trolley J. Ledwinka
Trolley-base F. Volk
Trolley-pole S. Speer
Trough rack, Feeding-W. A. McCollough
Truck, Car-J. C. Barber, *et al.*
Truck, Incline-C. E. M. Miller
Truck, Piano-S. Bilger
Turbine, Elastic-fluid W. J. Cartwright
Turbine, Internal-combustion M. St. Clair
Turbines, Vane-ring for B. Ljungstrom
Turn-table turner R. R. Farrell
Type-writer S. Snell
Type-writing machine J. H. Barr, *et al.*
Type-writing machine calculating attachment F. J. Tillman
Type-writing-machine ribbon mechanism O. C. Kavle, *et al.*
Typographic machine B. A. Brooks
Valve G. L. Crook
Valve, Alarm-R. Grinnell, *et al.*
Valve, Automatically-controlled gas-G. M. Bierly
Valve, Cylinder relief-C. P. White
Valve, Equilibrium stop-J. Koenig
Valve, Quick-acting radiator-E. P. Allen
Valve, Radiator-G. M. Bard
Vehicle-brake B. P. Trice
Vehicle-wheel A. E. Beall & C. F. Skellenger, *et al.*
Ventilator L. Silberman, *et al.*
Voting-machine indorsing device W. J. Lausterer, *et al.*
Voting-machine interlocking mechanism F. Keiper
Voting-machine key operating and locking bar W. J. Lausterer
Voting-machine lock-out A. J. Gillespie
Wagon-timing device E. F. Chandler
Wardrobe, cupboard, or the like, Folding A. Ullom
Wash-board, Self-soaping F. M. Gerdon
Washing-machine E. F. Beebe, *et al.*
Washing-machine attachment F. L. Bartelt
Washing-machine gearing H. Cammack
Waste-trap L. E. Welch
Watch, Repeating T. A. & J. B. Connolly
Water-softener J. E. Bain & B. W. Smith
Water-tube boiler, Vertical E. C. Fisher
Watering-tank A. N. Eaton
Weatherproof composition H. Gallinowsky
Weeder C. F. Billau
Weeding and transplanting implement, Hand H. L. Hughes
Weighing device Q. B. Wright
Welding and bonding rails and other metal pieces C. F. Jacobs
Whip-socket A. R. Tuttle
Whips or like article, Case for N. F. Alston
Wind-shield J. H. Sprague
Wind-wheel H. Schmit
Winding machine, Thread-M. Metz
Window-screen, Roller E. H. Gibson & A. D. Bevier
Window-shelf F. H. Gnekow
Window-ventilator W. H. Dean
Wire coiling and weaving machine M. B. Lloyd
Wire fabric, Interlocking hook for G. B. Smith
Wire fabric, Making coiled-M. B. Lloyd
Wire frames, Making G. K. Rix
Wood, Coloring W. A. Hall
Wood, Coloring or transforming W. A. Hall
Wood, Transforming W. A. Hall
Wrench W. H. Munro, *et al.*
Yarn or thread into carriers, Machine or mechanism for drawing F. A. Whitmore & W. Dougherty
Zinc ores, Treating F. T. Snyder

DESIGNS.

Automobile-horn L. Anguilli
Fabric O. Zschaemisch
Medal E. Fuchs
Rug A. Petzold
Rug F. A. Hass

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MECHANICAL PATENTS.

Adhesive fluids, Device for supplying J. T. Windle & R. E. Ollerenshaw
Adjustable trap J. H. Brady
Air-brake mechanism, Supplemental A. Doan
Air-compressor governor J. H. Kloer & D. B. Leavell
Alarm or time-check R. Turck
Album, Post-card H. P. Morris
Alkali chlorids, Apparatus for the electrolysis of J. Billitzer
Amusement device. S. Liebling & G. P. Schmidt, *et al.*
Armature, Knockdown E. W. Presbrey
Armatures of dynamo-electric machines, Winding for B. G. Lamme
Attaching device D. Hoyt
Auger, Post-hole H. E. West
Automobiles and other machinery, Transmission-gear for L. T. Rhoades
Automobiles, Suspension-spring system for C. A. Lieb
Axle connection for vehicle, Front-A. J. Goyette
Axle coupling, Reversible car-A. Markarian
Axle-skeins for vehicles, Constructing J. E. Wilcoxen
Bait, Artificial fish-N. W. Moran
Bait-holder J. F. Beatty
Barrel J. W. Denmead
Basins, &c., Stopper for wash-C. Meldau
Bearing, Foot-step ball-M. Gohlke
Bearing for grain-drills, &c S. E. Davis & H. B. Bozare
Bearing, Roller-L. J. Aldridge
Bed J. W. Fuller
Bed-rail-notching machine A. McLean
Bedstead W. Wokurka
Beer pasteurizing and cooling apparatus W. Wenzel
Bell, Signal-H. W. Eden
Belt attachment R. Dalmar & A. K. Wander
Belt-fastener J. W. Kidwell
Belt-tightener G. L. Wallace & R. Dow
Bicycle spring-for, H. C. Preston, Jr.
Bilge-water discharger C. A. Curry
Billiard-cue I. A. Gorman
Billiard-cue tip I. A. Gorman
Block-forming machine C. R. Walter
Block-machine W. L. Keller
Boat M. F. Thompson
Boat and vessel P. Igatz
Boiler-cleaner and feed-water heater A. N. Jones
Boiler furnace, Locomotive-F. F. Gaines
Boiler-hanger C. E. Lingenfelter
Boilers, System of washing and filling locomotive-W. White
Book, Blank, scrap, and similar E. F. Hoberg
Book, Loose-leaf T. C. Bruhn
Book-rest D. Duff
Boot or shoe C. Pease
Bottle S. Rolfson-Schmidt
Bottle-cap G. E. Stahl
Bottle-cap lifter and cigar-cutter E. C. Hunt
Bottle-holder J. F. Parker
Bottle mat, Milk-C. A. Steinman
Bow-separator C. E. Titchener
Bottles, jars, and the like receptacles, Closure for A. F. White
Bracket F. J. Moran
Brake system, Fluid-pressure W. H. Sauvage
Bridle-irons or stirrup or joist hangers, Machine for shaping W. Hansen
Brooder A. Noble
Brush, Bottle and like cleaning G. A. & C. C. Farrar
Brush-hook and ax, Combined C. E. Olson
Bucket for concrete building material N. C. Newerf
Buckle, Cross-line A. F. Carlson
Burglar-alarm, Electric M. Trautmann
Bust-reducing attachment J. M. Bodensiek
Calcium silicid, Producing T. L. Willson & M. M. Haff
Calculating-machines, Setting device for J. Graber
Calk, Removable G. S. Meyer
Calks on horseshoes, Machine for forming and sharpening V. T. Snover & M. H. Palmer
Camera mechanism, Photographic-W. Verbeck
Can-closing machine C. M. Symonds
Can covers, Apparatus for cleansing, sterilizing, and drying milk-C. H. Hood
Can feeding and righting machine M. D. Blakeslee
Can-heading machine, Single-B. Adriance & A. Calleson
Candle-gathering implement C. B. Manbeck
Candy-making machine W. T. Hudson & P. R. Camp
Candy-mold E. J. Hedrick
Car G. G. Fryer
Car-body J. M. Hopkins
Car chock, Railway-J. Kezon
Car-coupling W. L. Wright, *et al*
Car, Drop-bottom dump-H. C. Brunker
Car, Dumping-A. Becker
Car-fender E. Barrett, *et al.*
Car, Passenger-S. M. Curwen & W. M. Smith, *et al*
Car safety-stop W. Gunter
Car-seat H. Witte
Car-underframe A. Becker
Cars, Drop-door fastening for P. Furgeson & E. L. Wheland
Cars, Drop-door-operating mechanism for hopper-bottom A. Becker
Carbureter M. Steel, Jr.
Cards, Electrical pattern for the manufacture of jacquard P. Weissenborn
Carpet-sweeper G. B. Deacon
Caster-attaching bearing-box V. C. Luppert
Caster, Furniture-G. E. Neuberth
Caster, Leg-mount G. E. Neuberth
Casting rolls J. L. Lewis
Cement block, W. L. Keller
Casting rolls, Mold for J. L. Lewis
Cement blocks, Waterproof J. A. Fincke
Cement clinker, Process and apparatus for making C. Ellis
Centrifugal machine H. Schmitz
Chain-tightener C. H. Peterson
Chain tightener and lock F. A. Fox
Chair W. M. Clark
Check-bit T. Tippit
Cheese-cutter O. O. Ozias
China, &c., Apparatus for casting hollow and other ware of W. Stubbs
Chlorin, Separating and concentrating K. Goldschmidt & F. Spitzer
Chuck W. G. Sanborn
Chuck-drill J. Bradley
Churn J. T. Armstrong
Churns, Lever construction for R. M. Rowe
Chute-package A. L. Perpignan & G. H. Riebelman
Cigar-lighter F. J. Wildemann
Clasp G. N. Hall
Cleaning apparatus F. J. Seeley
Clock, Electrically-operated H. Gillette
Clover-huller J. C. Kistler
Clutch driving mechanism, Controlling means for electrical A. P. Steckel
Clutch mechanism for automobiles and for other applications, Friction-A. Balloca
Coal-washer F. R. Willson, Jr.
Coat G. W. Davis
Cock, Quick-acting bib-L. J. Sommer, Jr.
Cocks, Locking air-J. S. Sheafe
Coffee-percolator bag I. Norwood
Coffee-roaster L. Breyer
Coil-winding apparatus H. B. Smith
Coil-winding machine F. Mueller
Coke-drawing apparatus E. D. Ratliff
Colander M. A. Bailiff
Column, Wooden C. A. Nickerson
Comb E. Jennison
Composing-machines, Means for justifying tabular matter in typographical J. G. Holbourns & H. A. Longhurst
Composition of matter G. W. Boggs, *et al.*
Concrete bridge D. B. Luten
Concrete building and holding mechanism A. N. Doud
Concrete chimney construction G. Maschino
Concrete-mixers, Power charging device for E. B. Symons
Concrete-reinforce H. E. White
Concrete structure, Reinforced E. McCullough
Condenser G. B. Petsche
Condenser, Metallurgical W. M. Johnson
Containing-can C. M. Symonds
Controller-handle E. W. Stull
Coop or crate, Folding J. P. Carnefix
Copper-refining apparatus F. L. Antisell
Corn thinner and weeder, Hand-G. M. Hanger
Corset G. H. Colley
Corsets, Hip-reducing attachment for J. M. Bodensiek
Counter-skiving machine M. Canty
Coupling G. Sarrazin & H. Perreault, *et al.*
Cover-retainer J. F. Brown
Crate H. D. Bokop *et al.*
Crate, Folding R. H. Goddard
Crate, Shipping-J. E. Neeb
Cream-ripener T. L. Valerius
Cross-head A. Dubuque
Cuff-holder W. J. Neefs
Cultivator N. Tripp
Cultivator, Cotton-J. J. Green
Cultivator, Gravity hand-J. E. Hosmer
Current-transformer regulator, Alternating-A. C. Lasher
Currents machinery, Safety device for polyphase-J. M. S. Fontecha
Curtain-frame W. Sieckmann
Cut-off, Automatic C. M. Brown
Cycles and like vehicles, Toe-clip for the pedals of H. Frankenburg
Cylinder-head F. L. Sessions
Cylinder-nurling apparatus W. L. Nahm & E. J. O'Brien, Jr.
Decoy F. M. Oliver & C. B. Westcott
Delivery apparatus H. B. Murray, Jr.
Deposit and collection receptacle C. F. Bryant
Die-stock R. H. Burke
Dipping-tank J. A. Viktor & F. J. John
Dish-washing machine A. L. Pearce
Dispensing-receptacle K. C. Jopling
Display-case and valise, Combined C. Ellburg
Display-rack J. Rohsche
Door-adjusting device A. Hollmann
Door check and closer O. Anschutz
Door-opening device A. S. Flower
Door-stop S. P. Croswell
Dough-dividing machine T. W. Kaiser
Draw-bar carrier C. H. Tomlinson
Drawer-pull C. B. Adams
Dress-suit cases, traveling-bags, and the like Handle-cap for F. Waldschmitt, Jr.
Drill-steel coupling C. C. Hansen
Drills or other apparatus, Carriage for portable pneumatic R. H. Robinson
Driving mechanism N. Smelansky
Dye, Azo J. Jansen & W. Neelmeier
Dye, Brown sulfur R. Gley & P. Dieterle
Dye, Olive sulfur R. Gley & P. Dieterle
Eaves-trough strainers or protectors, Fastener for W. Feyler
Electric apparatus, Ventilating-plate and spacing-block for J. A. Baird
Electric furnace T. F. Baily
Electric heater C. F. Johnson
Electric-light cluster-fixture J. H. Caldwell
Electric machine, Dynamo-W. D. Pomeroy, *et al.*
Electric signal W. K. Howe
Electrical apparatus, Ventilating plate and spacer for H. D. Summers
Electrical energy on any circuit, Arrangement for indicating and recording permanently the maximum demand for W. W. Lackie & D. J. Steele
Electrical switch F. H. Buffehr
Elevator D. Corcoran
Engines, Adjustable crank for internal-combustion C. J. Gotti
Engines, Gearing for traction-A. W. Aitken
Engraving-machine A. Rostad
Envelop-opener W. L. Barber
Excavator, Hydraulic C. B. Askew
Explosive O. F. von Schroetter
Eyeglasses W. H. Weaser
Eyeglasses, Connection-guard for M. B. Korman
Eyeleting machine G. Goddu
Fabrics, Apparatus for removing lye from O. Venter
Fastener K. Green
Fastener for hinged closures, Adjustable J. Jenks
Faucet J. J. Smith, J. W. Ghiglieri, & G. W. Ingersoll
Feed-water heater J. W. Currie
Feeding live stock, Apparatus for D. W. Wright
Ferrule R. S. Gladding
Fertilizer-distributer S. E. Jones
Filing-cabinet E. C. Holland
Filter-cell G. M. Kneuper
Fire and temperature alarm or indicator C. Smith
Fire-bar A. Esplen
Firearm, Repeating W. H. Gates
Firearm safety mechanism W. H. Gates
Fishing device C. E. Evans & A. A. Heisler
Flexible material, Device for feeding F. L. Cummings
Flue-cutter E. M. Pope & I. J. B. Hanten
Fluid-controller C. J. Mackerey
Flying-machines, Screw-propeller for P. F. Degn
Fodder-cutter J. W. Halstead
Folder, Sectional S. B. Hutchinson
Folding box, Collapsible C. C. Bowen & J. A. Coffey
Forging-machine G. Peiseler
Fork attachment E. B. Manasek
Fuel, Domestic or steam-producing G. Griffiths
Furnace R. Rouse, Jr.
Furnaces, Device for feeding air to A. W. Brand
Fuse-receptacle B. P. Rowe & S. M. Kintner
Game apparatus W. H. Ell, *et al.*
Game device C. A. Hotchkiss
Garment facing-strip J. I. McDonald
Gas and air supply to large-chambered ovens H. Koppers
Gas apparatus, Acetylene-C. K. Sober
Gas, Apparatus for recovering light oils from natural J. L. Gray
Gas-burner, Combination H. Williams
Gas, Composition of matter for manufacturing hydrogen G. F. Brindley & P. M. Bennie
Gas-cut-off and safety device, Automatic M. F. Nichols
Gas-generator J. Darling
Gas-producer F. Weideneder
Gas-scrubbing apparatus J. J. Nix
Gas-washing apparatus O. H. Ensign
Gate T. S. Harp, *et al.*
Gearing G. A. Stenile
Gearing, Change-speed A. M. Wolf
Glass and concrete construction W. D. Bradley
Glass, Decorating W. J. Peterson
Glassware-forming machine T. W. Wood
Gold-separating apparatus J. D. Luttrell
Grain-chutes, Electromagnetic separator for B. M. Sypher
Grain-conditioning apparatus C. D. Stephens
Graphite, Making pure unctuous E. G. Acheson
Grinder, Screening-E. & E. O'Brien, Jr.
Gun, Self-loading recoil-H. Lehmann
Gun, Water-F. De Moulin
Guns from behind cover on targets, Apparatus for laying L. K. Scott
Hammer, Power-F. Raymond
Hammock-stand J. B. Patterson
Harness M. B. Gooing
Harness-hanger W. L. Taylor
Harrow attachment M. A. Jackson & J. A. Bristow
Hat-bag W. K. Shannon
Hat-brim press to form welt edges C. E. Sackett
Hat-pin guard F. R. Greenwald
Head-rest M. G. Worth
Heater H. R. Bromley & A. R. Marshall
Hinge A. F. Englerth
Hook and eye C. S. Lichtenstein
Horse-detaching device N. M. Hollendeck
Horseshoe-calk G. S. Meyer
Horseshoe-calk, Removable G. S. Meyer
Hose-rack, Inclosed W. D. Allen
Hydrant J. D. Martin
Hydraulic motor C. Anderson & H. M. Ruddock
Hydrocarbon-burner G. A. Schoche
Ice-shaping machine I. Boyd
Incubator J. L. Nix
Incubators, Hygrometer for G. H. Lee
Ingots and other castings, Making sound metal R. A. Hadfield
Initiation-step E. L. Woodman
Inseam-trimming machine W. B. Keighley
Insulator, Section-break T. Varney
Intermittent line-switch F. F. Creighton

Internal-combustion engine.....D. H. Coles
Ironing-machine.....G. H. Spansail
Irrigating-ditches, Alarm for.....
.....H. I. Shotwell & W. McComb
Jar-opener.....C. A. Tolman
Jar or vessel closure.....G. Staunton
Journal-bearing, Antifraction.....W. V. Seifert
Journal-box.....W. M. Duncan
Juice extraction by diffusion, Continuous.....
.....K. Philipp
Kinematograph feed mechanism.....C. Urban
Knitting-machine, Cam-cylinder.....P. Abbott
Knockdown case.....G. M. Blasier
Knotter.....B. E. Byrd
Lace fabric and the like, Producing artificial.....
.....M. Ratignier & H. Pervilhac
Lace-making machine.....G. Krenzler
Lacing-hooks and the like, Machine for setting...
.....A. W. Hargraves
Ladder.....M. Bartos & J. Braunstein
Ladder, Step-.....S. Jones
Ladder, Trussed.....B. B. Briggs
Lamp, Alcohol-.....A. Rector
Lamp, Arc-.....G. M. Little
Lamp having magnetizable electrodes, Arc-.....
.....G. M. Little
Lamp, Incandescent.....E. H. Smith
Lamp, Incandescent gas-.....C. W. Harrison
Lamp, Miner's.....A. M. Van Liew
Land-clearing machine.....T. Rustad
Last.....S. S. Cameron
Laundry-marking machine.....J. C. Gebhart
Lawn-sprinkler.....P. Goemaere
Leather-perforating machine.....W. A. Dawes
Ledger, Loose-leaf.....J. Bystrom
Level, Protractor-.....A. J. Matter
Life-saving apparatus, Marine.....L. E. King
Lifting-dog.....D. Parry & E. Evans
Lightning-arresters, Adjunct for aluminum-cell...
.....E. E. F. Creighton
Liquid-fuel burner.....J. Darling
Liquids, Apparatus for filling vessels with.....
.....W. T. Curtis
Litter-carrier.....C. C. Lawson
Load-brake.....H. Weickel & H. E. Frentzel
Lock.....A. Leonard
Locomotive track-sander.....J. E. Ganson
Log and lumber car.....M. M. Russel
Loom.....R. Crompton & J. R. Fitton
Loom, Automatic weft-replenishing..A. E. Rhoades
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Looms, Filling-carrier for weft-replenishing.....
.....J. R. Fitton & C. H. Berglund
Looms, Mechanical weft-feeling mechanism for..
.....J. Taylor & E. W. Buckley
Lubricant-filling device.....C. E. Williams
Lumber-drier.....H. G. Cady
Lunch-box, Store-heat.....A. Carter
Mail-bag crane.....J. Edman
Mail-bag receiving and delivering apparatus.....
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Mail-bag receiving and delivering device.....
.....H. H. Behnke
Mail-bags to moving trains, Apparatus for the delivery of.....J. B. Driscoll
Mail-box.....C. H. Holton
Mail-box and letter-carrier's pouch....L. Viezzi
Malt-spreading-out apparatus.....G. Weinbeer
Manifolding apparatus.....O. Loewenbach
Mat.....E. W. Cruikshank
Match-box.....J. M. Cramer
Measuring and filling apparatus.....E. B. Ellicott
Measuring and packaging machine, Seed.....
.....F. W. Wild, Jr
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Measuring device, Glove-.....W. N. Ketchum
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.....A. Petit & G. de Berchoux
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Merchandise and book case, Sectional or unit....
.....H. Trost
Metal box.....G. H. Paine
Metal, Expanded.....H. E. Marks
Metal objects, Cutting.....
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Metal-planer.....G. Kuwada
Metal-working machine.....P. J. Havey
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Meter.....A. H. Taylor
Mica plates and the like, Machine for making....
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Milk and butter merging apparatus..B. N. Hawes
Milk-cooler.....W. J. Sonka
Milk for infants, Making.....P. Bergell
Milking-machines, Electromagnetic pulsator for..
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Miter-cutting machine for metallic binding for patterns, &c.....H. J. Sutherland
Molds, Composition of matter for.....R. Herbst
Molding-machine.....J. Kiburz
Money-box.....J. Nutry
Motor controller, Electric-.....F. L. Sessions
Motor-controlling device, Electric-...E. H. Geist
Mowers, Grass-catcher for lawn-.....F. Roush
Music-holder and leaf-turner.....W. G. Locke
Nickel and nickel-copper alloys, Manufacturing...
.....D. H. Browne
Noise-producing device.....T. Smith
Nursery-chair and satchel, Combined. M. E. Friend
Nut-finishing machine.....C. Sonneborn
Nut-lock.....A. E. Linton
Nut-locking washer.....J. B. Caine
Oil-burner.....J. H. Fones
Oil-can.....R. H. Booth, *et al.*
Oil-fuel-combustion process.....G. L. Bourne
Oil-supply device for gas-engines, Float-controlled
.....J. A. Charter
Oil to carbureters, Means for supplying.....
.....M. Steel, Jr.
Oiling device.....J. Vidina
Ore-crusher.....A. I. Eagle & A. E. Carlson
Ores, Reducing.....K. A. F. Hiorth
Organ, Reed-.....G. A. Buschmann
Outlet-box.....T. J. Fagen & S. C. Thomason
Packaging materials, Machine for....J. H. Howard
Packing-box.....C. C. Meng
Packing, Piston-.....H. A. Young
Pan-lifter.....E. E. Edwards
Paper from walls, Apparatus for removing.....
.....E. Wurmfeld & S. Wolpert
Pasteurizing apparatus.....S. Shapiro
Paving, Apparatus for making tar.....J. Ward
Paving, Sheet-wood.....J. H. Amies
Perforating-machine.....A. W. Fellows
Permutation-lock.....J. W. Estes
Photographic washing-box.....N. C. Merrill
Piano, Automatic.....H. Meyer
Pile-protector.....C. N. Hubbard
Plant-setter.....W. J. & R. H. Rhoades
Plastic materials, Making articles of.....
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Plate-holder.....W. S. Warnock
Platforms, System for braking movable.....
.....C. C. de Mocomble
Plier's, Jeweler's.....B. Feagle
Plow, Gang-.....C. Smart
Plow steering mechanism, Motor-.....C. F. Hill
Plunger.....H. E. Karnes
Pocket-book or bill-holder.....W. H. S. Fernald
Pole, Sectional.....O. O. M. Sciple
Pool-table.....R. Bailey
Post-card rack.....W. O. Kaiser & O. Klein
Potato-digger.....D. Y. & D. E. Hallock
Poultry-securing device.....J. F. Beatty
Powder-receptacle.....J. T. Stapleton
Press and vulcanizer, Combined....J. K. Williams
Pressure-generator, mixer, and engine, Combination
.....J. Illy
Propeller, Screw-.....D. F. Lawrence
Pull-socket.....G. B. Thomas
Pumping-engine, Direct-acting.....J. Hutchings
Pumps, Shaft-mounting for rotary....M. A. Mills
Punch.....S. A. Lesan
Push-cart.....J. Z. Benedict, *et al.*
Puzzle.....J. M. McCauley
Radiator fitting, Steam-.....J. J. Wilson
Rail-clamp.....R. N. Walton
Rail-fastening.....M. Eisig
Rail-joint.....M. E. Bethurum
Rail-joint, Emergency.....M. Holland
Rail-joint Splice-bar.....N. Benjamin
Railway, Automobile scenic.....A. G. Neville
Railway despatch-catcher.....A. Beamer
Railway fence and gate.....C. S. Shute
Railway-frog.....E. C. Price & W. H. Thomas
Railway journal-box and truck-frame L. G. Woods
Railway lighting and signaling device. C. A. Ward
Railroad-rail.....C. E. Neubauer
Railway-spike.....C. K. Butts
Railway-switch, Automatic frogless. J. A. Moore
Railway-tie.....C. R. Holden, *et al.*
Railway-track.....W. E. Sizemore, *et al.*
Railway-track instrument.....H. M. Abernethy
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Rake.....W. H. Jones
Raking, turning, and loading corn, hay, and the like Implement for.....O. Preuss
Range-finders, Instrument for adjusting.....
.....A. Barr & W. Stroud
Razor, Safety-.....G. A. Johnson
Receptacle, Folding.....L. P. Brown
Reel-holder.....J. P. Weaver
Refrigerator.....J. Pflanz
Refuse-receptacle.....V. Azzara
Relay device, Overload and reverse current.....
.....F. Conrad
Reversing mechanism.....V. H. Palm
Revolver, Self-cocking.....C. M. Stote
Ridge-roll.....T. H. & F. W. Martin
Road-engine.....H. N. Covell & J. H. Dickinson
Rock-drill.....W. L. Smith
Rolling-mill.....J. E. York
Roost, Chicken.....H. R. Kaneaster
Root-extractors, Riddle for.....B. G. Patterson
Rosin, Purification of.....H. T. Yaryan
Rosin-vat.....J. H. Tomberlin
Rotary engine.....J. S. Da Costa, *et al.*
Ruler, Parallel-.....H. Van Altena
Sad-iron-facing machine.....R. H. Dorsey
Sand-drier.....C. S. French
Sander, Pneumatic.....C. F. Kabisius
Sanitary closet.....J. H. Davis
Sanitary-shield packages, Machine for cutting and folding.....A. Stewart
Sashes, Antirattler for window-.....P. C. Wiest
Savings, Means for encouraging and facilitating the accumulation of.....C. F. Hess
Saw-feeder.....L. M. Endres
Saw, Hand-.....E. Wicke & F. Dark
Saw-swaging machine.....W. L. Covel
Sawmill, Railway-tie.....E. T. Thomas
Scaffold, Window-.....A. E. Bond
Scaling-machine.....C. H. Overkamp
Scraper, Road-.....E. G. Hartle
Screw.....A. Umholtz
Screw-driver, Pocket.....H. J. Borsch
Screw, Machine-.....J. L. De Steiger
Seal-lock.....H. Stamm
Seals, Making bottle-.....G. H. Gillette
Sealing vessels, Means for.....J. M. Hicks
Seam body-former, Lap-.....L. C. Krummel
Seat end.....E. G. Budd
Securing bodies together, Means for..R. C. Sayer
Seed, Duplex apparatus for delinting cotton-.....
.....W. L. Nahm & E. J. O'Brien, Jr.
Self-cleaning tank.....C. H. Vogler
Separator.....G. W. Christoph
Sewing-machine tuck-creaser.....F. W. Beckert
Shaft-coupling.....J. P. Golden
Shafts and the like, Sinking.....
.....D. E. Moran, J. W. Doty & E. S. Jarrett
Shapers and analogous machines, Supporting mechanism for draw-cut.....M. & H. E. Morton
Shipping-box.....C. A. Loockerman
Shock-binder.....T. G. Pool
Shoe-machine jack.....A. Bates
Shuttle.....J. Robinson
Sifter.....H. W. Case
Sign.....W. J. Bailey
Signaling device, Electric.....R. V. Cheatham
Signature-gatherer.....C. L. Smith
Single-trigger mechanism.....E. E. Osgood
Skate.....J. N. Stott
Smoke-box superheater.....M. Fischer
Smoke-consumer.....S. H. North
Smoke-tester, Plumbing.....A. F. Philip
Snap-hook and choke-strap connection, Combined
.....H. S. Burnett
Snow-guard.....F. A. Peter
Snow-melting apparatus.....J. B. d'Homergue
Soda-water apparatus, Valve-fitting for..P. Bunin
Sole-gouging machine.....J. Busfield
Speed-limiting device.....
.....W. D. Pomeroy & A. L. McHugh
Speed-regulating mechanism.....C. F. Leiger
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Square, Combination center-.....P. H. Allison
Stamp-mill.....O. C. Purkeynile
Stanchion.....M. A. Miley
Steel, Manufacture of.....W. R. Walker
Stenciling-machine.....E. F. Kunath
Stereoscopic appliance.....G. A. H. Kellner
Sterilizing apparatus.....E. Kronman
Stirrup.....F. M. Carter
Storage-chamber stuffing-box.....
.....F. A. Dailey & B. Long
Store-house for vegetables.....M. E. Bradley
Stovepipe-coupling.....E. E. Ramsey
Sugar-separator.....A. Maassen
Straw and manure spreader.....
.....W. G. Detwiler & J. E. Firebaugh
Surfacing-roll.....F. R. Allen
Surgical appliance.....H. Tunnessen
Surgical bandage.....J. Nore & N. T. Hillen
Swingletree attachment.....W. A. Koch
Switch.....O. P. Noisom & C. J. Lindewald
Switch-indicator.....C. A. Clark
Switching device, Fluid-pressure..R. V. Cheatham
Syringe case, Physician's hypodermic-..S. Sinkler
Tapping-machine.....J. M. Larson
Target-trap throwing-arm.....P. North
Telegraphy, Turner for wireless.....H. Dunwody
Telephone constructions, Wall distributing-ring for
.....J. H. Wilson
Telephone-stand.....C. S. Coom
Telephones to walls, Device for fastening.....
.....J. B. Horton
Temperature-indicator, Automatic.W. E. Campbell
Textile materials, Sizing.....J. Boyeux
Thermostat.....G. A. Weld
Thread and tape holder.....G. W. Weiss
Thread-cutting die.....L. Castracane
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Ticket holder and counter, Combined. L. S. Frambes
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.....B. & A. Gustiana
Time-recorder and the like.....R. Burk
Tire-protector.....D. Day
Tire-setting machine.....
.....H. T. Henderson & H. M. Lourie
Tobacco-stemming machine.....A. Grodsky
Tongs, Pipe and casing.....T. Mills
Tongue, Vehicle-.....M. R. Lunn
Tool, Combination-.....F. J. Stolle
Tool, Machine-.....G. Kuwada
Tool, Pneumatic.....A. Schum
Torpedo-tube.....C. Laurenti
Toys, Joint connection for mechanical...R. Steiff
Tracing instrument.....H. M. C. Jahnholtz
Transit.....P. Ferber
Trellis-wire dropper, Hop-.....W. A. Sloper
Trousers stretcher and hanger.....A. Holmes
Truck, Road-.....G. Sprung
Trunk, Cylindrical.....C. F. Hudnall
Truss.....G. W. Bell
Tube and box.....G. H. Bartlett
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Turbine, Gas-.....J. Illy
Type-writer.....W. E. Russell
Type-writer billing attachment.....H. B. Young
Type-writer paper-feeding device..U. A. Abrahams
Type-writer tabulating device.....W. H. Hulse
Type-writing machine.....C. H. Shepard, *et al.*
Umbrella, Folding.....K. S. Hummer
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.....W. L. Sperring & G. R. Pride
Universal joint.....D. Corcoran
Valve.....W. H. Newell, *et al.*
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.....J. G. Englehart
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Valve, Drain-.....H. M. Kirby
Valve, Flush-.....D. E. Selby
Valve, Flush-tank.....J. F. Cotter
Valve for flushing tanks.....F. Prichett
Valve for steam-heating systems, Automatic relief-
.....A. Mowell
Valve-gear for turbines.....C. Roth
Valve indicator, Gate-.....A. J. Richmond
Valve-lifting device, Antidry-meter-..R. E. Davis
Valve mechanism for steam-engines...J. C. Bird
Valve, Quick-acting safety-.....C. R. Mills
Vapor-burner.....W. Chausse
Vehicle-coupling.....A. Weisler
Vehicle drive-gear Motor-.....J. A. Welton
Vehicle steering-gear.....E. N. Daniels
Vehicle-wheel.....L. Inglee & C. M. Hart
Vehicle wheel, Road-.....G. S. Ogilvie
Vehicles, Coupling for power transmission in motor-
.....H. E. Coffin
Velvets, plushes, and similar fabrics, Cutting appliance for.....P. Hertzog
Ventilating-plate for laminated structures.....
.....P. A. Lange
Violin.....J. M. Gray, *et al.*
Wagon-box corner-iron.....J. B. Cross
Wagon-box lifting and dumping device J. F. Meyers
Wall.....D. B. Luten
Wall-tie.....J. Schirra & M. G. Frank
Washboard.....J. Schneider
Washing-machine operating mechanism.....
.....J. Edens, *et al.*
Washtub and heater, Combined.....M. E. Brattin
Watch potence or balance-foot.....J. H. Gorman
Water-closet.....A. Cochran
Water-heater.....G. V. Andrews
Water-lift.....F. O. De Hymel
Waterproofing fibrous materials.....A. O. Tate
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Well-drill.....H. B. King
Wheel.....W. S. Laughlin
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Wheel-rim, Detachable.....C. Kindscherf
Whip-socket.....J. W. Veit & J. N. Higgins
Wind-shield.....E. Flagg
Winding and doubling frames by means of a measuring-clock, Device for stopping....M. Ebeling
Windlass.....J. S. Oram
Window.....A. Kaselow
Window-cleaner.....J. Null
Window-fixture.....J. Grizzell
Window-frame.....J. Kahn & T. H. Kane
Window-lock.....N. B. Denison
Window-screen.....R. E. L. Parnell, *et al.*
Wire connector, Line-.....J. S. Pratt
Wire-stretcher....H. L. Bradbury & O. A. Grubb
Work-holder.....I. J. Van Huffel, Jr.
Yarn-drying machine....T. Allsop & W. W. Sibson

DESIGNS.

Glass, Sheet-.....H. J. Gilbert
Label-blank.....S. Cohn
Light-shade.....A. J. Sanford
Plaque.....J. F. Thomas
Sign, Illuminated.....R. Dittke
Spoons, forks, and similar articles, Handle for....
.....G. P. Ittig
Stove, Heating-.....A. F. Harter
Urn.....G. M. Fischer

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Aeroplane and hydroplane.....W. R. Turnbull
Agricultural implement.....W. H. Rice
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Alloy for armor-plates and other uses. E. Schneider
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Animal-trap.....C. H. Shoup, *et al.*
Annealing-box.....E. R. Williams
Automobile-radiator.....F. Todd.
Automobile seat-bodies, Apparatus for making....
.....M. H. Kashian
Automobile vehicles, Braking means for. A. Krebs
Automobiles, Valve-gear for descending..H. Saurer
Awning.....C. R. Goudie
Balance-staff pivot-truing device....D. L. Davies
Band-cutter and feeder.....W. Weis
Bandage, Abdominal.....A. Petrel
Basket, Fruit-.....J. Wagner
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Bearing, Roller-.....J. Newmann
Bed, Folding.....F. W. Abbott
Bedstead.....J. A. Grenier
Bicycle spring-fork.....C. Blankenheim
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Binder, Temporary.....C. D. Trussell
Binders, Extensible pillar or post for loose-leaf....
.....J. S. McComb
Blowpipe.....C. D. Fitzsimmons
Boiler.....V. E. Carter
Book holder, Note-.....C. L. Dahlberg
Book-marker.....E. R. Inman
Books, Folder for coupon-.....C. T. Raschiek
Boot-tree, Expansible.....A. G. Malmberg
Bottle-capping machine.....W. J. Cunningham
Bottle, Non-refillable.....P. Daniel
Bottle or can locking device.....H. E. Trevor
Bottle-rinsing machine.....A. Wolfensberger
Bottle-wrapper.....E. C. Rinner
Bottling and syruping aerated beverages, Machine for.....A. E. Munson
Box-fastener-applying machine.....P. H. Lettre
Brake-handle.....G. W. Rigney & S. J. Hanlin
Brake-shoe.....A. C. Vauclain
Braking mechanism.....J. P. Callahan
Breweries and bottling establishments, Pipe-line system for.....C. L. Bastian
Brush and shoe-polisher, Combination.....
.....E. Holm & A. Wobus
Brush-making machine.....G. S. Murdoek
Buckle.....R. U. Sourek
Bundle-loader.....L. M. Amdahl
Burnishing-machine.....H. Leibe
Button, Fastening-.....E. L. Watrous
Button-making machine.....E. Shantz
Cabinet, Barber's.....R. A. Grieve
Cabinet, Revolving ribbon-....J. W. Van Patten
Cable-hanger.....W. J. Hiss, Jr.
Calculating-machines with two counting mechanisms, Controlling device for.....R. Rein
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Can-closure.....W. J. Card
Can-tops, Machine for feeding.....
.....J. B. White & F. Wheeler
Cans, Machine for lining the covers of metal....
.....W. Plinatus
Car-brake.....C. Phillips
Car, Cash-entry.....P. M. Kling
Car, Convertible.....C. W. Benjamin
Car-coupling.....J. Timms, *et al.*
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.....M. H. C. Turnbull & C. W. Tomlin
Car-door.....R. R. Jones
Car-doors, Loading-gate for.....W. J. Atz
Car, Freight railway-.....J. G. Stoller
Car, Hopper-.....E. Ullmann
Car life-saving device, Street-.....W. De Silva
Car-placer.....W. W. Wilcox & S. Putman
Car-schedule.....G. G. Crane
Car-standard.....J. F. Fender
Car-wheel.....F. E. Canda
Carbureter.....O. D. Munger
Carriages, Sleigh-runner attachment for baby-....
.....F. C. Kengeter
Cart, Hopper-bottom.....B. W. Parker
Carton, Folding.....J. W. Galvin & G. Walters
Cartridge charging apparatus.....O. Bengtsson
Casing for balances and other instruments, Protecting-.....W. & A. Heusser
Caster for portable tables.....T. R. Treiber
Cement garbage-boxes, Mold for forming.....
.....J. M. Thinnes
Cemetery structure.....G. C. Simpson
Centrifugal switch.....C. L. Kennedy
Chance-controlled indicator..W. G. & O. S. Lamb
Christmas-tree holder.....H. A. Bailey
Churn-operating mechanism.....A. M. Johnson
Circuit-breaker.....C. A. Tueker
Circuit-breaker, Caloric.....C. C. Woodworth
Cistern.....O. M. Alexander
Clamp for racks and like devices..H. R. Langslow
Clock.....E. F. Herschede
Cloth-holding device.....J. F. Mitchem
Cloth-rolling tube.....L. Canon
Clothes-drier.....J. D. Quinlan & G. Mulvaney
Clothes-washer.....A. A. Broo,s & F. D. Crooker
Cluster-socket.....W. C. Jones
Clutch for concentric rotary parts....F. S. Ellett
Clutch, Variable-speed transmission-...D. George
Coating sheet metal, Apparatus for. B. Golesmith
Cock.....P. Mueller & A. C. Schuermann
Cock for mechanisms for heating liquids, Automatic combined gas and water. J. J. Lisch & W. L. Root
Coffee-grinder.....I. E. Brandrick
Collars, Holder for wing-point..... E. G. Skinner
Compass-hoods, Bearing-taking device for..A. Fey
Compressed-air signal.....R. Armstrong
Concrete, Spring-clip stirrup for reinforced.....
.....W. K. Fellows
Condenser, Electric.....E. Denieport
Condiment-holder.....A. Wolkenstein
Conduit, Flexible.....G. A. Lutz
Conveyers, Load-gripping mechanism for.....
.....L. C. Davidson
Conveyers, Pneumatic jet for.....E. W. Rice
Cooking device.....C. B. Trescott
Corer, peeler, and slicer, Apple-.....W. T. Ross
Corn header, Kafir-.....M. Brown
Cream-separator....E. R. Bailey & M. A. Ganiard
Cremator and urn, Combined waste-W. W. Cheney
Cue-clamp.....W. H. Patterson
Cuff.....R. Pennington
Cultivator attachment.....W. Lindesmith
Culvert.....J. H. Schlafly
Culvert-pipe, Sheet-metal.....W. N. Klotz
Currycomb.....A. C. Ditmar
Curtain-fixture.....C. W. & L. A. Friedman
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.....A. W. Wearren & C. von Philp
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Door-hanger.....M. E. Kanaly
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Door-operating device.....E. Posson
Door-securer.....F. W. Mills & A. Carlton
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Drier.....J. M. Urgelles
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Drive mechanism.....C. Jensen
Dust-pan.....J. Gugora & C. D. Flamm
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.....J. B. Obermeier
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.....E. Bouchaue-Praceig
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Furnaces, Combined building-ventilator and check
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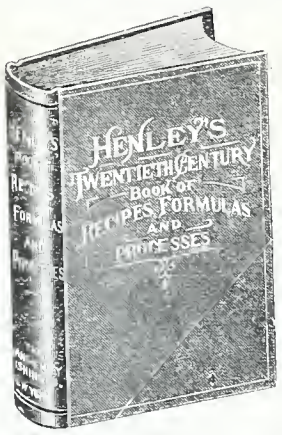
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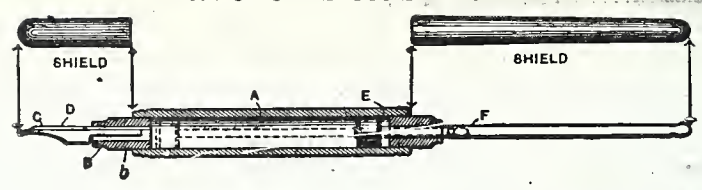
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THE ELECTRICAL SERVANT.

ELECTRICITY, for so many years regarded as an uncertain agent and as of greater potential danger than benefit to humanity, has been reduced to the humble position of man's servant. The lightning has been harnessed, and made to do our cooking and housework.

The utilization of waterfalls as a source of electric current has done more to popularize the use of this power than anything else. A community with water power at hand can have electricity for lighting and power purposes under conditions of exceptional economy, and even without water power, electricity may be generated by steam or gas engine units on a commercial basis far more profitable than the installation of a gas lighting system, with expensive piping throughout a sparsely settled district. Many plants for lighting cities and towns would lie idle during the day, if openings were not found for the use of electricity in industries. A description of the work done by this power in various lines of human activity should be as thrilling to youth as a tale of Jules Verne. The magic house in France, where electricity does everything from opening the door to visitors and brushing the dust from their shoes as they enter, to feeding them and soothing their slumbers at night, has already been noticed in these columns. A similar establishment has for some years been in existence in New Jersey, where an ingenious American engineer set his brains to work to find out in how many different way electricity could be made useful. The number and variety of these applications are remarkable. The servants are summoned by a wireless telegraph apparatus, which consists of a transmitter about the size of a paper weight, with antennae 18 inches in height, from which the Hertzian waves pass through the walls of the intervening rooms and ring a bell in the kitchen. All the cooking is done by electricity, as well as the heating and lighting. Brooms are replaced by the electric vacuum cleaner. Sewing machines are operated by the same power. The tongs for curling my lady's hair are electrically heated, and electric foot warmers are available if the weather is cold. The clothes are washed and ironed by the same power: the dishes are washed, and the cows milked. In the dairy, the bottle washers, the churn, the cream separator, the butter worker, the can scrubber, the ice crusher, are all operated by the same plant that cuts the feed for the stock and heats the orchard in times of frost. Sheep shearing and cotton ginning are applications of this ubiquitous power in other places. There is practically no industry in which it cannot be utilized. The accompanying cut shows the devices in an electrical carpenter's shop. As may be seen in Fig. 1, the grind stone and the band saw are connected by means of wires to the source of power, and a saw table is illustrated in the foreground, with apparatus for stopping the lumber as it is cut. The shop is arranged to be brilliantly illuminated, so that work may be continued at night when there is a rush of orders.

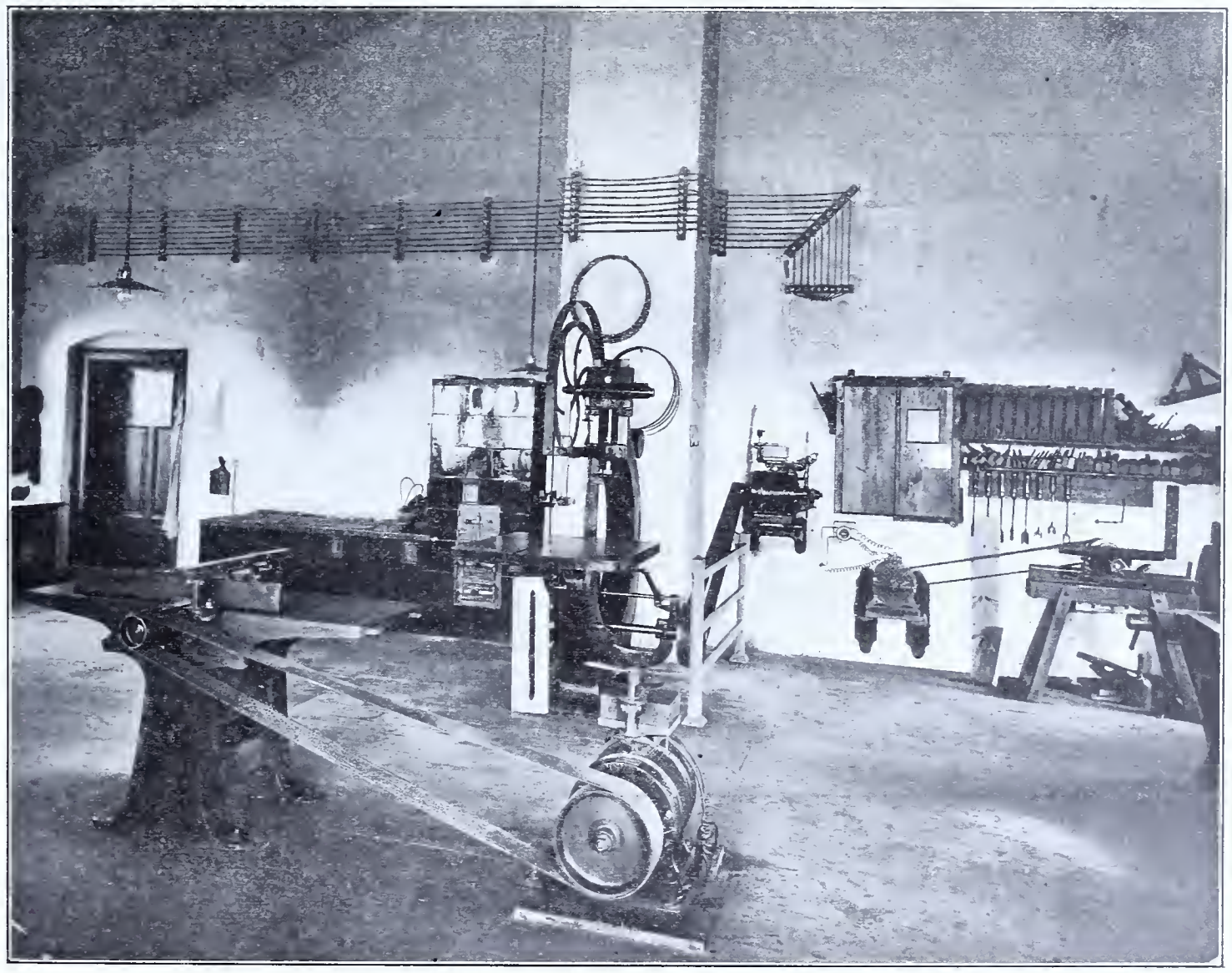


FIG. 1.—ELECTRICAL CARPENTRY.

Figure 2 shows a timber saw which has found favor on account of its adaptability, being transportable and self-contained. The dynamo operates the gear wheels, which are connected with the fly wheel. A device for throwing the apparatus into and out of gear is provided. The frame holds the saw

in position, permitting it to move back and forth. With the use of such a machine, "sawing wood" is no longer a synonym for tiresome and monotonous labor.

Other uses of electricity are almost too familiar to mention. The time has apparently come when an old saying must be revised, for today, at any rate, it is electricity that makes the world go round, although some students find that love is only an affair of subtle electrical currents. Herein Uncle Sam has outstripped Cupid and is again to the front, for we lead all countries in the manufacture of electric apparatus. In many of the most highly productive manufacturing districts. electric power is being installed ten times more generally than any other kind. Some of the small things that have been made possible through the application of electricity to the old, exhausting labors of life, are: hot water bags, that get hot and stay hot as long as you want them without refilling with water; heating pads, that can be applied to any part of the body, and are better than mustard plasters, for they do not burn nor do they lose their strength; vibrating machines that take the place of masseuses: flat irons that stay hot without being returned to the stove, that weigh only a few pounds, yet press heavily without any exertion on the part of the person using them; waffle irons that cook on both sides at once; glue pots that stay warm; pyrographic irons that are hot as long as the current is turned on; beer pumps; an air disinfectant that keeps the atmosphere of your living room continually free from germs; carpets that heat the room. The flour in the bread we eat is produced by electrical machinery; the cloth which covers one's body owes its debt to the subtle vibrating medium. The use of tantalum has given electric lights a new lease on life. Tantalum, which is a rare new metal, has the advantage over carbon as a filament, that when a tantalum filament breaks all you have to do is to pass electric current through the lamp and heat the filament red hot. Then shake the lamp. One part of the broken wire will touch the other and when the two do touch they will fuse, making the lamp as good as new. When a carbon filament is broken, there is no hope of repairing it.

Electric transportation lines in the United States carry six times as many passengers as the steam lines, although the mileage of the latter is at least seven times greater. Yankee push, which has built a trolley line to the pyramids of Egypt, is today supervising electric transportation all over the world. Every year the electric age is being brought to new millions. To quote from a scientist of international note: "The single agency of electricity has increased the span of mortal life, judging by what can be accomplished in it, to many times that of our forefathers. Judged either by communication, transportation or production, we, through electricity, can do more in an hour than they could in a day."

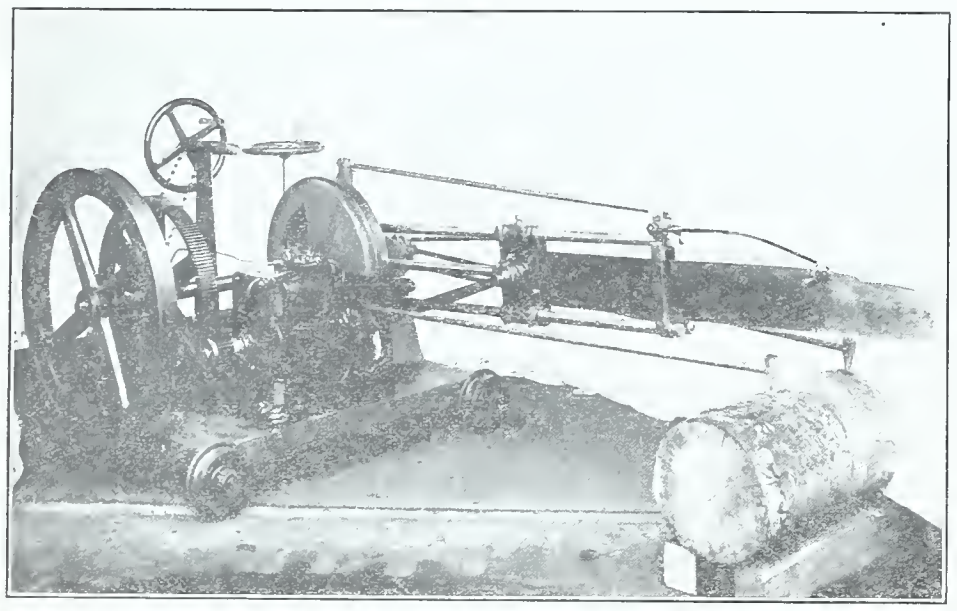


FIG. 2.—ELECTRICALLY OPERATED WOOD CUT TIMBER SAW

Opening and Sealing Envelopes.

It has hitherto been possible to open only about thirty letters per minute, but a new machine, invented by a young girl, makes it a simple matter to open over four hundred letters in the same space of time. The apparatus, as described in the *Van Norden* Magazine, does not cut the envelopes as other contrivances do, but rubs away the edges so that the contents are left unmutilated.

A number of letters are placed in a box, and this is run by electricity over a rubber roller set diagonally in a plate. Once past the roller, the current is turned off and the letters removed, all ready to be looked over. Then comes a man with a device by which he claims he can seal, without dirt or too much dampness, 6,000 to 8,000 letters in an hour. He further says that the machine will register every envelope that passes through it, and it is unnecessary to sort the mail for size or thickness. After being sealed, the envelopes are held in position until they are dried.

To keep themselves posted in the progress of the arts in which they are interested, inventors and manufacturers should subscribe for the INVENTIVE AGE, which publishes a list of all patents issued each month. The low subscription price and the character of the publication entitle it to the support of all the inventors of the country.

A SELF-OPENING DOOR.

By C. VAN LANGENDONCK.

THE new self-opening door illustrated herewith is giving every satisfaction where it has been installed for trial. This door is opened by the weight of the person passing through. On either side there is an ordinary mat arranged on a floating platform. By a series of levers the weight of the person is transmitted to the mechanism which causes the door to open. The working will be better understood by referring to the drawing given in Fig. 2. The platform *A* is carried on four rocking levers *B* which are secured to the shafts *C*. In order to make these shafts turn as easily as possible they are carried on rollers *D*, which reduce friction to a minimum. The arms *E* are secured in the center of the shaft *C*, and carry, on knife edges, the counterweight *F*, which overcomes the weight of all the working parts, and which is capable of adjustment. The arms *H* are connected to the sliding piece *J*. This actuates a double-acting oil dashpot, which prevents the doors from swinging back rapidly. It will be noticed that the table platform has a parallel motion; in other words, the tray sinks equally at all the suspension points regardless of where the weight may be applied on the mat. The doors are actuated through the lever *K*, which is moved by the arm *L* on the shaft *C*. They swing about the centers *M* and *N*, and there are curved slots in the platform to allow the casting *R*, which carries the woodwork, to protrude. This casting is supported on three balls situated in a bearing, and this reduces the friction considerably. A corresponding bearing is placed at the top of the door, as is shown in the engraving, Fig. 1. The same illustration also shows the curved slots in the platform, and how the door opens. The tray only sinks 1¼ inch when trodden on, and the operating leverage is 20 to 1. There do not appear to be any delicate working parts, or any mechanism which will not stand considerable wear.

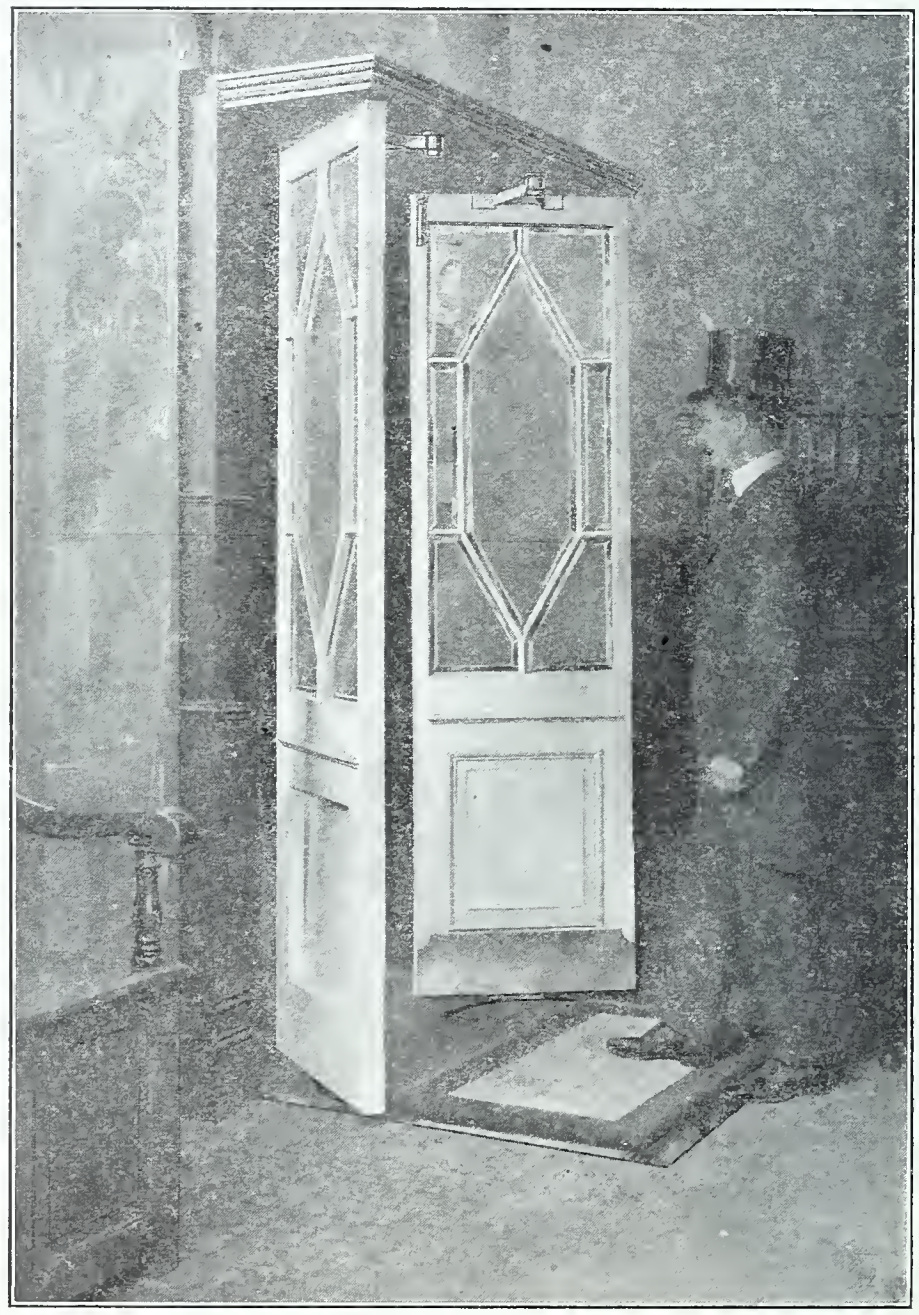


FIG. 1.—SELF OPENING DOOR IN OPERATION.

One of the greatest difficulties to overcome in self-opening doors is the slamming; the closing is easy enough, as the weight is always the same, being slightly in excess of the necessary power required. In opening, the case is different; a small child may step on the mat, whose weight is barely sufficient to open the doors, or two or three heavy persons may step on the platform simultaneously, in which case the extra power would cause the doors to move at an undue speed and

cause violent slamming unless some powerful check were introduced. The engraving (Fig. 3.) shows the form that has been adopted for this anti-slamming check.

It consists of a double piston working in a cylinder, the whole being submerged in an oil-tight bath or tank. The piston is moved in the cylinder by means of a lever, keyed from one of the moving parts of the mechanism.

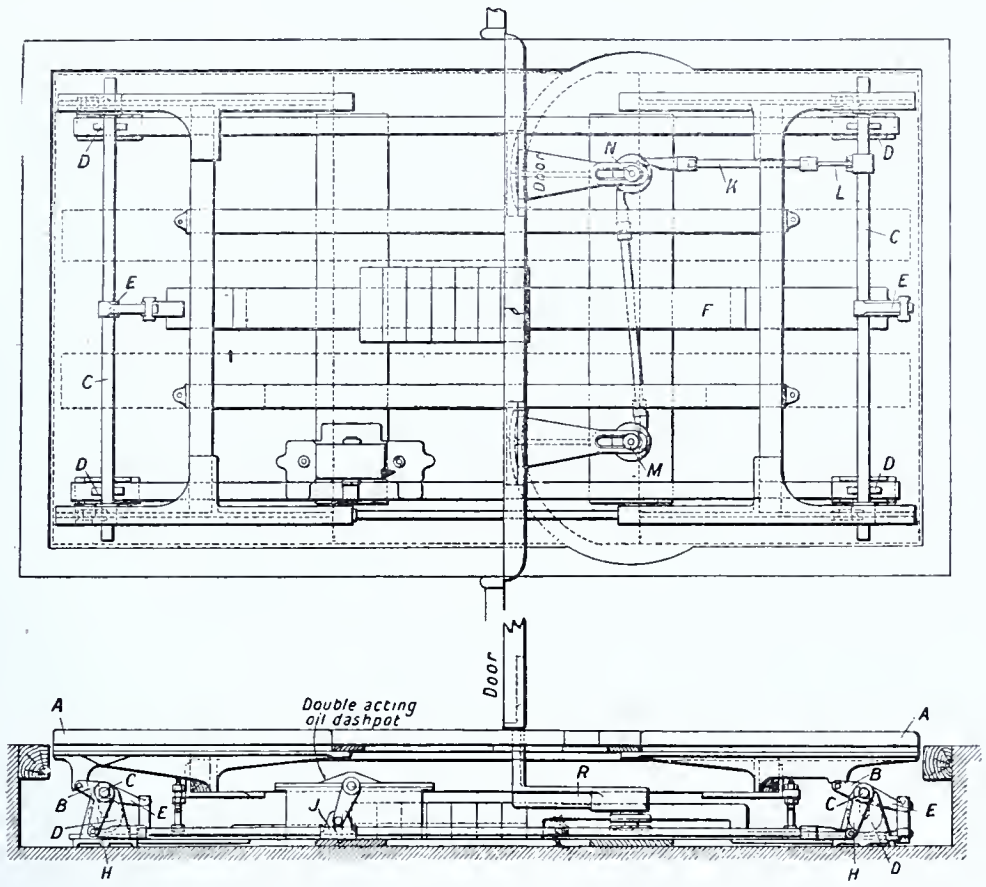


FIG. 2.—SCHEME OF MECHANISM OF SELF-OPENING DOOR.

This lever works outside the oil tank, and actuates a similar lever inside the tank, which in its turn operates the double piston through a slot in the upper portion of the cylinder. The plain end of the double piston controls the shutting of the doors, the end provided with grooves controls the opening. Holes are provided at each end underneath the cylinder, through which the oil can be forced out. Each of the double pistons is provided with a leather retaining valve, to allow the oil to pass behind the piston freely, but to prevent its escape except through the holes. As the lever reaches either end of its travel, one or the other of the double pistons passes over the holes in the bottom of the cylinder and closes them in the same manner as in a hydraulic starting valve used for lift work. When the holes have been passed, the last small quantity of oil is squeezed out past the piston, which is not packed; also through slots in the adjusting screws, which can be regulated as desired. Thick oil is preferably used. The fact that the pistons are unpacked, and that the oil

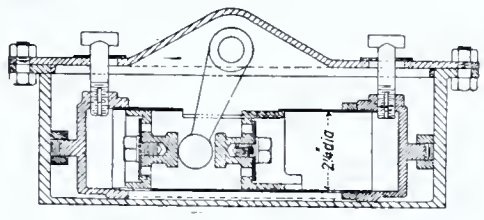


FIG. 3.—ANTI-SLAMMING CHECK.

cannot leak out of the tank or bath, tends, it is claimed, to make the dashpot reliable, and unlikely, when once adjusted, to vary or get out of order.

Electricity in Fighting Disease.

In addition to microbes, man carries in his body the perpetual menace of exhaustion, that ageing of the faculties that ends in death. A characteristic of old age is the arterio sclerosis, which causes the artery to lose its elasticity and become rigid. In many cases lack of nutrition and other causes create a like condition in the young, and for years doctors have been studying the problem of restoring elasticity to the over-tense arteries.

An artery, says a French writer whose article is quoted in the *Review of Reviews*, is comparable to a rubber tube for the circulation of illuminating gas. When the tube is pressed too hard it cracks. Arterial tension is gauged by special instruments, which may be compared to the manometers of steam engines. The application of high-tension currents of great frequency to therapeutics has gone a long way toward solving the problem of rejuvenating the sick arteries. In industrial machines, the current is reversed 100 and 200 times per second; as applied to the human system, a current is reversed 400 or 500 times per second. In this form of treatment the patient is shut in a sort of cage and bathed with torrents of electric fluid. His body glitters with sparks which flash to the accompaniment of detonations. He is the center of a storm of fireworks, yet he feels nothing. After thirty minutes sojourn in the bath, the arteries are much more elastic. The cure is not permanent, but the patient has been rejuvenated for a time, and until the effect wears off he will work as he did when at his best.

In cases of neuresthenia, too, electricity has been found to be of great value. The treatment in this instance is nothing more than a judicious recharging of nerves by a mechanical contrivance which yields electric energy. The subject is seated on an insulating stool and subjected to the sparks and inhalations obtained by placing a special brush in his mouth. Electricity will be the good fairy of the twentieth century if, in addition to light, heat and other marvels of contemporary science, it proves to be a renewer of youth.

British Patents.

Inventions, Patents and Designs is the title of a recent book by G. Groydon Marks, M. P., the special object of which is to interpret the new British patents and designs act. He attributes the loss of trade on the part of British manufacturers to their conservatism, and their unwillingness to accept improvements upon the original machines which were the basis of their enterprise. There are many methods, the author states, of fostering industries, but those dependent upon artificial restraints or non-commercial conditions are unquestionably the least satisfactory for the national as against the purely individual advantage. Many of the industries now in successful operation in different countries had their birth in Great Britain, and while there is a certain degree of prestige attached to the originating firm or nation, yet if the development and increasing needs of others are not recognized and provided for by adaptations that go toward securing a betterment of the productions, the prestige will soon be forgotten and the trade passed to those who are less fettered by habit and less hampered by old ideas. It cannot be too readily borne in mind that invention is of international rather than of national growth, and that as with science, so with manufacturing arts and industries, no country can claim a monopoly in that type of mind and intellect that originates and discovers improvements. Modifications are always possible, and improvements become imperative in every conceivable industry. Were it not so, it would presuppose a cessation of thought, and blindness to the possibility of adapting improvements in one art to become aids in developing other arts. There is no such state as absolute finality or perfection, either in industrial productions or in the universal realm of invention. Therefore an inventor or a manufacturing firm should not remain satisfied with what he has produced, even though of considerable importance for the time, but should be on the alert to simplify, alter or vary it, or competitors will arise to make what is demanded by more economical or possibly more efficient methods. The keen interest evinced in these subjects in America is contrasted with the self-satisfaction and conservative prejudices of British firms, and the losses in trade supremacy on the part of the latter can be directly traced to this cause. The author goes on to explain in detail the meaning and object of patents in general, as well as the special application of the term in Great Britain, and quotes in full the new patents and designs act. The working clause of the latter is the one that most nearly interests American inventors:

"The grant of a patent being declared for the benefit of the industry rather than for a reward for the individual, the new requirements are so drafted as to oblige the patentee to meet the British demand for his invention by manufacturing it in the British Isles, instead of simply importing therein the articles made abroad. The English patentee cannot get his article manufactured abroad and then sell in Great Britain, without the serious risk of some person starting to make for himself, and thus infringing his patent after four years from date, and then pleading that the patent is liable to revocation, and is consequently invalid, in consequence of the manufacture being carried on mainly abroad. It is probable that the home working of inventions will be greatly expedited under this fear of a defendant being able to plead foreign manufacture, should he be attacked after four years have passed since the patent was applied for. Any infringer can plead the invalidity of the patent, and set up in answer to attack a counter-claim for revocation of the patent."

It is worthy of remark that the law provides for granting reciprocal terms for non-working in countries that do not require such action, and it may be that we can make some treaty with England, similar to the one recently ratified with Germany, which will enable Americans to escape the necessity of working their patents there.

Wireless Torpedoes.

As soon as it was found that sound waves could be transmitted by the Hertzian waves, inventive minds began trying to use the same medium for the operation of machinery. The experiments have not been commercially successful, though one man managed to run a small car on a track by electricity sent through the air. A Frenchman has now brought out a marine torpedo which responds readily to the action of wireless electricity. Tests made on the Seine at Paris a few weeks ago showed that he had succeeded in producing something more than a plaything. The device when out of water looks like two torpedoes, one above the other and about six feet apart. The upper part is a float, and the lower section is the real torpedo. In it are a motor battery of accumulators, an apparatus for receiving the wireless waves, and at the nose an explosive charge weighing 1800 pounds. The ordinary torpedo contains about 200 pounds. When placed in the water, the engine of destruction sinks to the upper floater, which carries two masts and the usual antennae for receiving the wireless impulses. Upon the masts are electric lamps, which are lighted as soon as the Hertzian waves reach the antennae; they are, however, directed aft so as to be invisible to the enemy.

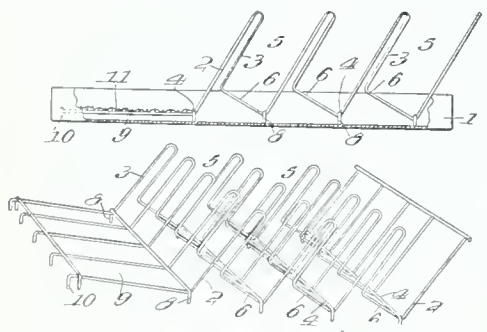
In the recent experiments, the inventor made use of an instrument which somewhat resembled a piano. When he touched one of the keys, the torpedo, now some distance away, responded at once. By sending a varying number of waves, he moved the rudder of the contrivance to right or left as he pleased. He made the torpedo turn sharply around in its own length and come directly to him. He had it under absolute control all the time. These torpedoes are very expensive to manufacture, and the inventor says he will not sell one for less than $11,000.

CLEVER NEW PATENTS.

Dish Drainer.—Pruning Hook.—Truss.

Dish Drainer.

All housekeepers who have been obliged to wash a number of dishes have been confronted with the problem of draining them in some convenient manner that will not occupy too much space. Among the appliances devised for this purpose, a recent patent has several features of simplicity and utility that commend it. It consists of a rack in which the dishes are held in the desired position for rinsing, and a drain pan having an outlet to receive the drip water. As seen in the cut,

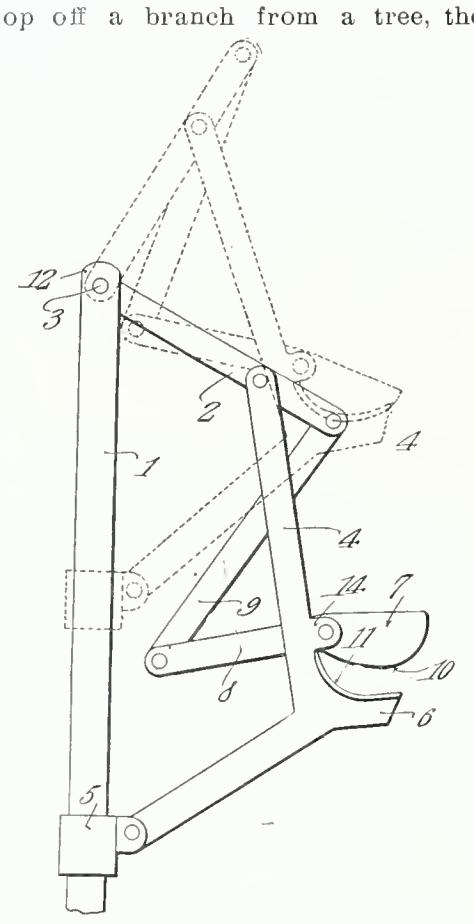


the drip pan 1, preferably rectangular in form, holds the dish rack 2. The latter is made of longitudinal and transverse tie wires, bent to form the rectangular dish compartments 5, having upwardly inclined bottoms 6 and inclined sides 7. The tie wires 4 extend across the longitudinal wires at the lower edge of the bottom of the dish compartments and are provided at opposite ends with downwardly projecting extensions 8, which provide a means for supporting the bottom of the racks, about one inch above the bottom of the casing. The rack is also provided with the longitudinal horizontal extension 9, the outer edge of which is supported above the pan by the downwardly bent portion 10 of the wires 3. A wire netting cover 11, having a mesh of suitable size, is arranged on the extension 9 to prevent knives, spoons, forks and the like from falling between the wires.

In using the device, the dishes are placed in their respective compartments of the rack in the most convenient manner, the plates in one, the cups in another, and so on. The water is poured over them, and owing to the angular position of the compartments it is obvious that the dishes will receive the full benefit of the rinsing. The device is the invention of Thomas B. Garretson, of Oskaloosa, Iowa.

Pruning Hook.

With the extension of fruit farming and the constantly growing market for products of the orchard has come a demand for more convenient appliances for keeping the trees in flourishing condition. Pruning hooks are among the most indispensable of these appliances, and a recent patent by John Swegles, of Wayne, Mich., is a good example of this class. A rod forms the supporting member, with which the remaining portions of the device are assembled, it being understood that the length of the supporting member will be governed by the exigencies of the proposed use. It is slotted at the upper end and forms arms 12, between which is pivotally mounted one extremity of a lever 2. Intermediate the inner and the outer ends of the lever is pivoted the upper extremity of an arm 4 which, extending downwardly and flexing inwardly toward the supporting member, carries at its lower extremity a head 5 adapted to enclose the supporting member and slide thereon. Intermediate its ends the arm 4 is provided with an outstanding lug 14 to which is pivoted a movable jaw 7, arranged to extend transversely across the arm 4. The portion of the movable jaw 7 which is disposed between the arm 4 and the supporting member is somewhat longer than that portion of the movable jaw which lies beyond the arm, so that the said jaw may be provided with an effective power arm 8. Projecting outwardly from the arm 4 below the lug 14 is a fixed jaw 6. A link 9 extends across the arm 4, one arm being pivotally assembled with the outer end of the lever 2, and the other end with the inner end of the portion 8 of the jaw 7. The cutting edge 10 of the said jaw is downwardly convexed, and the cutting edge 11 of the jaw 6 is concaved toward the arm 4, so that when the jaws 6 and 7 co-operate to lop off a branch from a tree, the



branch will tend normally to move inward toward the arm 4 and not to slip from the grip of the jaws. The weight of the arm 4 and of the other members whereby the jaws are assembled with the supporting element, normally tends to cause the head 5 to slide downward upon the supporting member, and the jaws will thus be forced apart when the device is not in use.

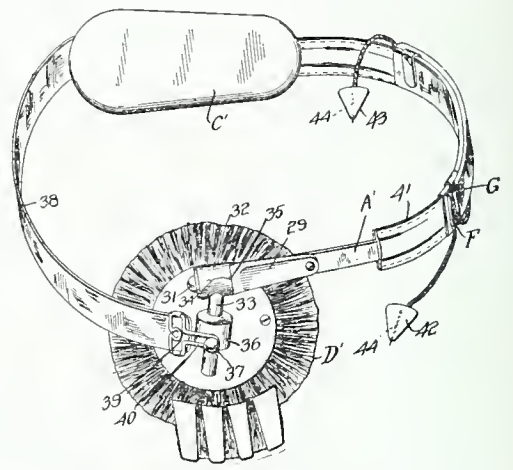
In pruning, the branch is interposed between the jaws 6 and 7, which as already stated stand normally apart. A downward pull upon the rod will cause the head 5 to slide upward thereon, the link 9, owing to the length of the power arm 8, causing the movable jaw 7 to co-operate with the jaw 6 and cut away the limb. As the latter falls away from the jaws, the weight of the assembled parts will cause separation of the jaws, and the device is thus placed in position for another operation.

Truss.

A simple and readily adjustable truss has been lately patented by George W. Bell, of Kansas City, Mo. A supporting spring (indicated at A^1 in accompanying cut) is suitably shaped to fit easily upon the hips of the wearer, and is made of any metal, such as silver, that is plated or otherwise protected against corrosion. It may be readily bent or adjusted to any peculiarities of anatomy of the person using it. It carries back and front pads C^1 and D^1, the latter being composed of a number of layers of leather, stitched or riveted together. A flat spring is interposed between two of the layers, of such dimensions as to project at the lower edge of the pad, where it is provided with notches or serrations forming resilient members, which are capable of being individually manipulated to exert varying degrees of pressure. The pad D^1 is equipped with body engaging cushions having flanges that engage the spring fingers and are subject to the direct pressure of the said fingers. By bending the fingers, the flanges may be made to exercise varying degrees of pressure against the body of the wearer, which pressure may be minutely regulated. The cushion may be saturated with any medicament which it is desired to use.

For the purpose of mounting the pad D^1 in position for operation, it is provided with a supporting spring to which the tubular sleeve 36 is integrally connected. Into this is threaded a screw 37. Upon the front end of the supporting member there is screwed a casting 29, having a bifurcated terminal socket which is internally threaded for the reception of a slightly tapering screw or bolt 31, by the insertion of which the bifurcated socket portion will be expanded so as to bear frictionally against the sleeve 32, which has an arm 33 radial to the axis of the bolt. The sleeve 32 is provided at one end with notches 34, adapted to be engaged by a lug 35 upon the casting 29. Hence when the parts are assembled together and secured by means of the screw 31, the parts will be held securely in position and the sleeve 32 prevented from turning upon the socket portion of the casting, partly owing to the friction due to the expansion of the socket portion by the insertion of the tapering screw, and partly owing to the engagement of one of the notches 34 with the lug 35. The socket 36 engages the arm 33 and is provided with a set screw 37, which holds the pad firm. It is obvious that the pad is universally adjustable, and may be readily retained in any position.

The back pad C^1 rests lightly upon the hips, and is made of several thicknesses of leather with a facing of textile material and a stuffing of something soft, such as cotton wool. The



pad has metallic keepers which slide on the rear ends of the member A^1, and the latter has a metallic loop seated in a recess of the pad, and a set screw bearing against the supporting member, upon which the loop is secured in such a manner as to retain the pad against displacement. By loosening the screw, the loop and pad may be readily adjusted lengthwise of the supporting member.

The truss may be retained in position for operation by means of a single elastic strap 38 having terminal loops 39 and 40, which engage the set screws that are utilized for mounting the front and rear pads in position. Any suitable protective casing may be used, as shown at 41. An electrical attachment may be applied, a battery F within a casing G being mounted upon the supporting member and provided with positive and negative disks 42 and 43, having pins 44 whereby they may be mounted upon or connected with the body of the wearer. The use of such appliances is so well understood that no detailed description thereof is necessary.

PATENTS

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LATEST COURT DECISIONS IN PATENT, COPYRIGHT AND TRADE-MARK CAUSES.

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NATIONAL TUBE CO. v. AIKEN.

(Circuit Court of Appeals, Sixth Circuit. July 11, 1908. 163 F. R. p. 254.)

1. PATENTS—INVENTION—TRANSFER OF DEVICE TO NEW AET.

The taking of a device from one industry and its application to a new use in another may constitute patentable invention when the original inventor never designed nor actually used it for the purpose to which it was later applied.

2. SAME—AGGREGATION OF ELEMENTS.

The mere bringing together of old elements, which in their new places do no more than their original work and do not cooperate with other elements in doing something new and useful, is not invention; but, if they co-act with each other in a new and unitary organization so as to produce a more beneficial result than by their separate operation, it may constitute a patentable combination.

3 SAME—UTILITY OF DEVICE.

That a machine shall produce an original result is not necessary to patentability; but if the new arrangement increases the effectiveness of the old by increased product or by lessening the cost, the fact affords evidence of invention.

4. SAME—"PATENTABLE COMBINATION."

Where the elements brought together in a new organization co-operate to produce a single practical and useful result, it constitutes a patentable combination, and it is not important whether they act simultaneously or successively.

5. SAME—INFRINGEMENT — APPARATUS FOR COOLING AND STRAIGHTENING METAL PLATES.

The Aiken patents, No. 450,360, for an apparatus for conveying and cooling metal plates, and No. 492,951, for an apparatus for straightening metal plates, which embodies the substantial features of the earlier patent with additional devices, constituting a true combination, and not a mere aggregation of elements, were not anticipated, and both disclose patentable invention. Also, held infringed.

HILLARD v. REMINGTON TYPEWRITER CO.

(Circuit Court, S. D. New York. July 24, 1908. 163 F. R. p. 281.)

PATENTS—ANTICIPATION-IMPROVEMENTS IN TYPEWRITER ESCAPEMENTS.

The Hillard patents, No. 554,874 and No. 580,281, cover related improvements in typewriters, the essential feature of each being the use of a beveled dog escapement, and are void for anticipation by a machine made by one Diss in December, 1890, which contained an escapement having every essential feature of those of the patents.

HOGAN v. WESTMORELAND SPECIALTY CO. et al.

(Circuit Court, E. D. Pennsylvania. July 27, 1908. 163 F. R. p. 298)

PATENTS—INVENTION—SALT DREDGE.

The Hogan patent, No. 752,903, for a dredge for salt or pepper, having a celluloid cap, was not anticipated and discloses patentable invention, as applied to a dredge for salt, although the ouly new feature of the device is the substitution of celluloid for other materials previously used in making the cap; it being shown that celluloid possesses a property which prevents the salt from absorbing moisture and becoming caked. Also, held infringed.

CRAMER & HAAK v. 1900 WASHER CO.

(Circuit Court, M. D. Pennsylvania, July 27, 1908. 163 F. R. p. 296.)

1. PATENTS—INVENTION—USE OF OLD MECHANICAL DEVICES.

Except in inventions of the most primary character, new mechanical forms and appliances are not to be looked for, and there may be patentable invention in making use of those which are known in the same or kindred arts, by so adapting and combining them as to bring about new or improved results.

2. SAME — INFRINGEMENT — WASHING MACHINE.

The Cramer & Haak patent, No. 829,631, for a washing machine consisting of an oscillating tub adapted to be run by power instead of by hand, was not anticipated, and discloses invention. Also, held infringed.

HENNEBIQUE CONST. CO. v. ARMORED CONCRETE CONST. CO. OF BALTIMORE et al.

(Circuit Court, D. Maryland. January 28, 1908. 163 F. R. p. 300.)

PATENTS — INFRINGEMENT — REINFORCED CEMENT GIRDERS.

The Hennebique patent, No. 611,907, for a cement joist or girder strengthened by iron rods or bars, is limited to a construction in a continuous girder, in which the strengthening rods in each span extend over the intermediate support and into the next span, so as to increase the strength of the girder next to such points of support. So construed, held not infringed.

DUNN MFG. CO. et al. v. STANDARD COMPUTING SCALE CO.

(Circuit Court of Appeals, Sixth Circuit. May 25, 1908. 163 F. R. p. 521.)

PATENTS—INVENTION—COMPUTING CHEESE CUTTER.

The Dunn patent, No. 800,431, for a computing cheese cutter, consisting of a new combination of old elements, which eliminates certain parts of prior machines and simplifies the mechanism, so as to produce a better and more practicable and salable machine, discloses invention; also held infringed.

NEW YORK PHONOGRAPH CO. v. NATIONAL PHONOGRAPH CO. et al.

Circuit Court, S. D. New York Feb. 5, 1908. 163 F. R. p. 534.)

1. PATENTS—LICENSE—CONSTRUCTION.

An exclusive license to sell phonographs within a stated territory granted by an assignee of patents therefor from the patentee, with the further right to such improvement patents as should be granted to him within a term of 15 years, must be construed with reference to such patents and as covering only phonographs containing the patented inventions and improvements which are owned by the licensor

2. SAME—SCOPE—RIGHTS OF LICENSEE AS AGAINST THE LICENSOR.

Where the executory provisions of such provisions of such contract of assignment to the licensor, which required the patentee to assign future improvement inventions, also required the assignee corporation to pay to him annually a stated sum for experimental expenses and to pay the cost of the future patents, and by reason of its insolvency and dissolution it failed to make such payments, the assignor was not thereafter bound to make improvements or patent his inventions for the benefit of the assignee nor its licensee, nor was a purchaser of the assets of the assignee with notice of the license bound to fulfill such executory agreement for the licensee's benefit.

3 SAME.

A provision of a license contract prohibiting the licensor from granting to others any rights for the use of phonographs or supplies therefor within the licensed territory, construed, and held limited to the phonographs and supplies manufactured under the patents and which were covered by the license.

4. SAME.

A grantor of an exclusive license nnder patents within a certain territory, and also its successors, who are in privity with it as to such license, are estopped, as against the licensee, to deny the validity of such patents, or that they expired before the term for which they were granted by reason of the expiration of prior foreign patents for the same inventions.

5. SAME—VIOLATION OF INJUNCTION—CONTEMT OF COURT.

A defendant, which, as successor to the grantor to complainant of an exclusive license to sell and use within a certain territory phonographs and phonographic supplies embodying patents owned by the licensor, was enjoined from violating such license agreement by selling such phonographs and supplies within the licensed territory, held in contempt of court for a violation of such injunction.

B. F. AVERY & SON v. J. I. CASE PLOW WORKS.

(Circuit Court, E. D. Wisconsin July 2, 1908. 163 F. R. p. 842.)

PATENTS—WRONGFUL INSTITUTION OF INTERFERENCE PROCEEDINGS— RIGHT OF ACTION FOR DAMAGES.

The action of a defendant iu causing interference proceedings to be instituted and prosecuted in the patent office, thereby delaying the issuance of a patent to complainant, although malicious and for the purpose of obtaining the benefit and use of the invention in the manufacture, does not give a right of action at law for damages.

SUDDARD v. AMERICAN MOTOR CO. et al.

(Circuit Court, D. Massachusetts. August 13, 1908. 163 F. R. p. 852.)

PATENTS—SUIT FOR INFRINGEMENT—COSTS.

Under Rev. St. § 4922 (U. S. Comp. St. 1901, p. 3396,) where more than one claim of a patent is sued on in a bill in equity to restrain infringemont, and one claim is held void, although others may be held valid and infringed, complainant is not entitled to recover costs; nor is he entitled to a decree, except on filing a disclaimer of the void claim, which otherwise invalidates the entire patent, and the better practice is to require such disclaimer to be filed before final decree.

RUSHMORE v. MANHATTAN SCREW & STAMPING WORKS.

(Circuit Court of Appeals, Second Circuit. July 27, 1908. 163 F. R. p. 939.)

1. TRADE-MARKS AND TRADE-NAMES-WORDS SUBJECT TO APPROPRIATION—DESCRIPTIVE TERMS.

The words "Flare Front," as applied to automobile lamps, the shell of which flares in front to enclose a large glass, are descriptive, and cannot be monopolized by a single manufacturer.

2. SAME—UNFAIR COMPETITION—IMITATION OF DESIGN OR DRESS OF ARTICLE.

One who manufactures and sells a well-known article of commerce, like an automobile search light, inclosed in a shell of graceful but unpatented design, may maintaina bill for an injunction, profits, and damages against a defendant who sells an automobile search light inclosed in a similar shell, although his name appears prominently thereon as maker, and he has never represented that his lamps were made by complainant, if it is shown that the similarity of the shells does, or is likely to, deceive purchasers.

LEWIS BLIND STITCH MACH. CO. v. PREMIUM MFG. CO.

(Circuit Court of Appeals, Eighth Circuit. Aug. 21, 1908. 163 F. R. p. 950.)

1. PATENTS—DOUBLE USE.

The application of a device to a new use, that is so closely related to a prior one that the applicability of the device to the new use would occur to a person of ordinary mechanical skill, is only a case of double use, and does not involve invention.

2. SAME — MONOPOLY NOT AFFECTED BY NONUSER.

A patentee is under no obligation, during the life of his monopoly, to use or place upon the market a device or machine embodying his invention.

3. SAME—EQUIVALENTS.

A patent for an invention, which is neither primary nor a slight improvement on the prior art, but possesses substantial patentable novelty, covers a reasonable range of equivalents.

4. SAME—INTERPRETATION.

In interpreting the claims of a patent, proper regard should be had to the natural import of the terms in question, the context and the specification.

RICHARDS et al. v. MEISSNER et al.

(Circuit Court, W. D. Missouri. Sept. 11, 1908. 163 F. R. p. 357.)

1. PATENTS-SUIT TO OBTAIN PATENT-ISSUES AND PROOF.

A suit under Rev. St. § 4915 (U. S. Comp. St. 1901, p. 3392), to obtain the issuance of a patent to complainant, is subject to the ordinary equity rule that the evidence must be relevant to the issues made by the pleadings, which in such case can relate only to complainant's right to a patent, and he is not entitled to introduce proof to defeat defendant's right, as well as his own, by showing that because of the prior state of the art neither party was entitled to a patent.

2. SAME—QUESTIONS OF FACT-CONCLUSIVENESS OF DECISION OF PATENT OFFICE.

The decision of the Patent Office and the Court of Appeals of the District of Columbia in interference proceedings, awarding priority of invention to one of two applicants for a patent, is controlling as to such question of fact as between such parties in a subsequent suit brought under Rev. St. § 4915 (U. S. Comp. St. 1901, p. 3392), unless the contrary is established by evidence which carries thorough conviction.

TRINIDAD ASPHALT MFG. CO. v. STANDARD PAINT CO.

(Circuit Court of Appeals, Eight Circuit. Aug. 11, 1908. 163 F. R. p. 977.)

1. TRADE-MARKS & TRADE-NAMES—NAMES SUBJECT TO APPROPRIATION-"RUBEROID."

The word "Ruberoid" cannot be appropriated as a trade-mark for a roofing made of felt saturated with a gum composed of the residuum of animal fats, and which is in the nature of soft, flexible rubber; such word not being a fanciful, arbitrary term, but merely a misspelling of "rubberoid," which is a common descriptive term signifying a resemblance to rubber in appearance or characteristics, and the use of which belongs to the public.

2. SAME—UNFAIR COMPETITION — USE OF SIMILAR DESCRIPTIVE WORDS.

A manufacturer, which adopted the word "Ruberoid" as a trade-mark for a roofing material, which trade-mark was invalid as an attempt to appropriate the descriptive term "rubberoid," is not entitled to an injnnction on the ground of unfair competition against another manufacturer because of its use of the name "RubberO" to designate a similar roofing, which was plainly marked with defendant's name as manufacturer, and where there was no imitation of the form, dress, or appearance of complainant's packages, beyond the fact that both complainant and defendant, in common with all manufacturers of similar roofing material, put up their product in rolls.

BAGLIN et al, v. CUSENIER CO.

(Circuit Court of Appeals, Second Circuit. Aug. 3, 1908. 164 F. R. p. 25.)

TRADE-MARKS AND TRADE-NAMES — INFRINGEMENT- UNFAIR COMPETITION—INJUNCTION.

For many years the order of Carthusian Monks established at La Grande Chartreuse, in France, made and sold a liqueur claimed to have been made by a secret process, which became widely known as "Chartreuse" throughout the United States, where such name is also registered as a trade mark. The order having been expelled from France by the government, its entire property, including its distillery, products, good will, and trade-marks, were sold to defendant by a receiver under an order of the courts, and defendant, although having no knowledge of the secret formula, commenced the manufacture of a similar liqueur, which it sold under the same name, using the same bottles formerly used by the monks and the same labels, which contained a signature and certain symbols peculiar to the order. In the meantime the monks established a factory at Tarragona, Spain, where they continued to make and sell the liqueur in accordance with the original formula, using, however, a different label and style of packages. Held, that the action of the French government and courts did not vest defendant with the right to use the name and labels of the monks in the United States, and, while it had the right to state on its labels the place where its liqueur was made, it would be enjoined from doing so without accompanying words stating the facts and clearly distinguishing its liqueur from that manufactured by the monks, and from imitating the original labels in such manner as to mislead purchasers.

DITTGEN v. RACINE PAPER GOODS CO.

(Circuit Court E. D. Wisconsin. May 1, 1905. 164 F. R. p. 84.)

INJUNCTION—SUBJECT OF PROTECTION—INJURY TO BUSINESS.

Equity has jurisdiction of a suit to enjoin injury to a manufacturing business by circulating statements that the product is an infringement of patents, and threatening suits for infringement against the manufacturer and his customers, in bad faith, for the sole purpose of injuring his trade, and without intention to sue.

MECHANICAL INVENTIONS AND DESIGNS.

Patents for which have been procured through the Patent Soliciting Office of E. G. Siggers, Patent Lawyer, Washington, D. C.

Jesse Holloway, Doe Run, Mo. Folding and Adjustable Chair.—The object of this invention is to provide a novel and simple chair structure employing a canvas bottom and back which can be readily adjusted, compactly folded, is strong and durable, and cheap to manufacture.

Charles F. Graham, Sellersburg, Ind. Sound Producing Mechanism.—This invention relates particularly to diaphragms for sound producing machines, and has for its object to provide a device which will accurately produce and record sounds with clearness and without harsh and mechanical resonance, and may be readily manufactured in any desirable shape. This result is effected by making the diaphragm of gelatine with a central triangular projection.

Peter M. Ravenskilde, Cabery, Ill. Starting Means for Sound Reproducing Mechanism.—This invention relates to means for starting sound mechanism at predetermined times, and has for its object to provide a mechanism that can be employed in connection with the usual sound reproducing mechanism and includes as its controlling means an ordinary alarm clock, whereby the graphophone may be caused to start at a certain time.

James P. McGill, Chicago, Illinois. Mechanical Toy.—This invention relates to mechanical toys, and has for its principal object to provide a toy in which movable figures are adapted to imitate the various movements of prize fighters in action, thereby forming a toy which is highly amusing and easy of manipulation.

Martha C. Hammond, Chattanooga, Tenn. Skirt Measuring Device.—This invention relates to means for determining the length of ladies skirts, and has for its object to provide a simple and inexpensive device whereby the length of a skirt can he accurately secured and marked for tucks, and the like.

Robert H. Higginbotham, Remlap, Ala. Rotary Engine.—This invention relates to engines employing rotary pistons, and the principal object of the same is to provide a simple engine which can be driven by steam, air, gas, water, or other fluid; is readily reversible, so that it will operate with equal efficiency in either direction, and is compact so that it will occupy but little space.

Charles A. Long. Columbus, Ohio. Hoe.—The principal object of this invention is to provide a hoe of a peculiar shape having means that will sever the roots between the edges of the hoe, and thus eliminate entirely the objectionable gathering of the roots and trash upon the shank, consequently avoiding the necessity of repeatedly cleaning the hoe of such mechanism.

John Archdeacon, Carlisle, Ky. Storm Hood.—The object of this invention is to provide a novel and simple storm hood and closure that can be readily applied or removed from the umbrella top of a vehicle with ease and expedition and without the necessity of alighting from said vehicle to attach or detach it.

George H. Pendleton, Corydon, Iowa. Process of Tanning.—This invention has for its object to provide a novel, cheap, and thoroughly effective method or process of tanning hides, pelts, or the like, consisting in first softening the hide or pelt and removing the flesh therefrom, preparing a preliminary bath by boiling together water, soda and ammonia, afterwards adding gum gamber and boiling the same, allowing the hath to cool, placing the hides or pelts therein for a predetermined period, adding to said hath, gum arabic, oil of hops and extract of wild cherry, allowing the hide or pelt to remain until tanned, removing the hide or pelt from the final bath, and oiling said hide or pelt.

Axel Wettervik, Iron River, Mich., inventor; Klas A. Lindgren, assignee, Stambaugh, Mich. Ice Road Making Machine.—An object of the present invention is to provide a machine designed for making ice roads, and equipped with means for melting the snow and ice to level a road, and to cause the water to flow into and freeze within the hollow places, whereby a smooth ice road adapted for sleighs and sleds may be easily and quickly made.

Oscar M. Human, Sherman, Texas. Envelope Stamping Machine.—This invention has for its object to provide an envelope stamping machine, adapted to moisten the face of the envelope and affix one or more stamps to the moistened surface. Another object of the invention is to provide an envelope stamping machine adapted to receive one or more sheets of stamps, and capable of severing the stamps, one at a time, from the sheet, and of holding and thereby controlling the severed stamp until the same is affixed in proper position to an envelope.

John H. Gardner, Dalton, Ga. Seed Planter.—An object of this invention is to provide a seed planter, adapted to plant two kinds of seed, and capable of depositing the same in a furrow either alternately or simultaneously. Another object of the invention is to provide manually and automatically operable mechanism for dropping the desired amount of seed the desired distance apart.

Warren C. Patterson, Tamaqua, Pa., inventor: Charles C. Gibson, Williamsport, Pa., assignee. Automatic Brake Operating Attachment for Signals.—An object of the invention is to provide a device designed for use on various kinds of railways, either steam or electric, and adapted to be automatically operated by various types of signals, and capable of positively operating a brake controlling valve and of not only stopping a train, but of causing the engineer or fireman to leave the cab and reset the brake valve.

Isaac N. Williams, Foltz, Indiana. Gate.—It is the aim of the present invention to provide a gate, equipped with oppositely disposed diagonally arranged bracing members, capable of longitudinal adjustment to counteract sagging, and provided with means for securely maintaining them in their adjusted positions.

Julius A. Lindeman, Chicago, Ill. Combined Chalk Sharpener and Paper Weight.—An object of this invention is to provide a chalk sharpening device, adapted to serve as a paper weight, and designed for sharpening tailor's chalk, and constructed to enable the same to be conveniently held for cutting the edges of such chalk at the desired bevel.

John W. Gregory, Coldwater, Tenn., inventor; Mattie F. Storey, Coldwater, Tenn., and John W. Young, Jr., Elkton, Tenn., assignees. Cotton Compress and Pneumatic Gin Feeder. Two patents.—The first patent covers a cotton compress, equipped with plunger operating mechanism capable of being readily thrown into and out of operation and provided with an actuating pulley, adapted to be connected by a belt with any suitable power.

The second patent relates to pneumatic conveyers for carrying cotton from a wagon to a gin house, and it has for its object to equip the feed pipe of a pneumatic conveyer with efficient means for loosening up the cotton in a wagon to enable the pneumatic conveyer to operate with greater rapidity, and to obviate the difficulty and inconvenience of scratching or raking the cotton loose by hand.

John F. Ball, Estep, W. Va., inventor; V. B. Greene, Greenview, W. Va., assignee. Wire Stretcher.—An object of this invention is to produce a wire stretcher adapted to enable one person with ease to stretch a series of either woven or barbed wires past a fence post, and capable of holding the same while the wires are stapled or otherwise secured to the post.

William F. Elliott, De Kalb, Ill. Corn Sheller.—It is the aim of the present invention to provide a device designed particularly for use by women and children when shelling corn in small quantities, and adapted to take the place of one of the natural corn cobs usually employed when corn is shelled by hand, and capable of providing a more rapid and effective means for removing the kernels from the cob.

William C. Dick, Freeport, Ill., inventor; H. C. Eich, E St. Louis, Ill., assignee. Adjusting Device for Locomotive Driving Boxes.—This invention has for its object to provide adjusting means for locomotive driving boxes, and is adapted to permit the wedges thereof to be adjusted from the outside of a locomotive without the danger and inconvenience of crawling beneath the same to effect such adjustment. Another object of the invention is to enable lost motion between the forward and rearward pedestal jaws to be readily taken up, and to provide means for preventing the adjusting devices from becoming rapidly worn.

Frederick E. Hopkins, Sterling, N. Y. Extension Car Step.—An object of this invention is to provide an extension car step, adapted to be readily applied to the steps of railway passenger car or coach, and equipped with means for enabling it to be easily lowered into position for use and to be raised after use by a single movement of an operating lever.

James A. Scott, St. Louis, Mo. Rail Joint.—An object of the present invention is to provide a rail joint adapted to dispense with fish plates, and constructed to prevent the noise and jar incident to the passage of the wheels of a train over an ordinary rail joint. Another object of the invention is to provide means for preventing the rails from spreading, should the connecting bolts become broken.

Ethelbert W. Burrows, Warren, Pa. Wick Attachment for Lamps and Other Burners.—An object of the invention is to provide a wick attachment, adapted to be applied to various kinds of wicks and capable of affording a greater flow of oil and of producing a steady light of increased brilliancy from a low-grade oil. Another object of the invention is to provide a wick attachment, which will not require adjustment after it has been applied to a wick, and which will enable a wick to be used until it is practically entirely consumed by the flames.

Bert E Carothers, Milan, Missouri. Colander.—It is the aim of the present invention to provide a colander, designed for separating the juice and pulp of fruit from the skin, seeds, stones, etc., and capable of being easily and rapidly operated and of being readily cleaned after the straining operation is completed.

Alfonso G. De Waldo, Warren, O. Wash Boards. — An object of the present invention is to provide for wash boards a combined holding and cushioning device, capable of retaining the wash board in position in a tub, or other receptacle, and adapted to yieldably support the upper portion of a wash board in spaced relation with the upper edge of a tub to permit the wash board to vibrate when rubbed either up or down, whereby the hand of the operator is relieved of the jars incident to the rubbing of the clothes.

John W. Steel and John C. Titus, Norfolk, Va. Machine for Stemming Peanuts.—This invention has for its object to provide a machine for stemming peanuts, designed for the use of both farmers and cleaning factories, and equipped with a plurality of picking rolls geared together, and adapted to pull the stems from the peanuts without injuring the latter, and capable of automatically reversing the operation of the rolls for changing the points at which the stems are pulled, whereby the pulling action will he effected throughout the entire series of rolls.

Adam T. Smith, Greensboro, N. C., inventor; Wm. Y. Everton, Grifton, N. C., assignee. Earth Auger.—An object of this invention is to provide an earth auger, designed for digging holes for posts, poles and the like, and capahle of enabling a hole to be rapidly bored and of removing the loose earth, when it is withdrawn from the hole. Another object of the invention is to provide an earth auger, adapted to operate in a vertical position on either level or hilly ground, and capable of plumbing itself and of being positively guided during the boring operation, so that the hole will be vertical. It is also the object of the invention to provide an earth auger, adapted to be forced into hard or stony ground, and capable of being compactly folded for transportation from one place to another.

James E. Auclair, Dennis Port, Mass., inventor; Novelty Incandescent Lamp Co., Emporium, Pa., assignee of entire interest. Advertising Device.—This invention has for its object to provide an advertising incandescent lamp which will not only be attractive and will strikingly set forth the matter to be advertised, but may he suspended or placed upon a surface, the structure being such that when employed in the latter manner, the lamp will not roll and the main body thereof will be spaced from the supporting surface.

Joseph Wiedemeier Jr., and A. A. Wiedemeier, Carroll, Iowa. Two patents. Display Apparatus.—The first invention relates to means for displaying laces, embroidery and the like material, and has for its object to provide means whereby the material can be mounted on a holding card from which it can be readily unwrapped, and at the same time is displayed over a backing of different color and character so that the pattern and type can be readily seen.

The second patent also relates to means for supporting laces and embroidery holding cards and the like, and has for its object to provide a supporting means for a number of cards or other holding devices, said devices being movable beyond predetermined positions so that the material or article held by each can be independently examined, the devices, however, automatically reassuming their normal positions when said examination has been completed.

NEW PATENTS FOR SALE.

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FOR SALE—Improved Syphon Cream Separator and Milk Skimmer for household milk bottles. Address, William Kolvig, No. 54 Beacon Street, Quincy, Mass. feb

FOR SALE—I am owner of Collapsible Box, patented August 31, 1909, No. 932,806. Will sell same for $3,000. Address, Oscar A. Paulson, River Falls, Wisconsin. feb

FOR SALE—Patent No. 915,003, issued March 9, 1909. The Whisler automatic screwdriver: the best on earth. Address, Box 364, Burlington, Kansas. feb

FOR SALE—U. S. Patent No. 889,151, granted May 26, 1608. Street Car Fender. Has telescoping section to save persons struck by moving car. Address, H. M. Prater, Box 27, Crocker, Missouri. feb

FOR SALE—Patent No. 856,018. Power Shovel. Price $1000. Patent No. 917,525, Safety Appliance for R. R. Cars $4000. For further information write to R. Belden, Pulga, Cal. feb

FOR SALE—Patent No. 924,392, issued June 8, 1909. This invention is a weeding attachment for any cultivator. Will sell outright or fifteen per cent on royalty. Good for potatoes, hops, corn, etc. Address, J. J. Smith, Banks, Oregon. feb

FOR SALE—U. S. Patent, No. 630,598, issued August 10, 1909. Sash Fastener. Something simple, cheap to manufacture, useful and convenient. Should be welcomed as an assurance of safety in every home. Address, Robert Henry, Blue Lake, Humboldt County, Cal. feb

FOR SALE—Patent No. 930,903. Irrigation ditch outlet or floating water gauge. Avoids difficulties due to irregularity of flow. A great labor saver. Good for either a company or private users of water, as it allows a fair distribution. Address, William H. Tucker, Vernon, B. C., Canada. feb

FOR SALE—Patent No. 932,269. Smoking pipe for automobilists. Tobacco or ashes do not blow out while riding in a fast motor. No wind, rain or air pressure can get into pipe. Will be a big money-maker. Address, Albert Gloede, Suffern, N. Y. feb

FOR SALE—Patent No. 926,856. Combined Belt Slide Button and Drawers Supporter, dated July 6, 1909. Will sell outright or place on royalty plan with reliable firm. Address, Arthur C. Davis, Mulberry, Florida. feb

FOR SALE—Patent No. 923,820. Metallic Cross Tie. Patented June 8, 1909. For information address, G. A. & A. M. Dickey & C. H. Hoag, Judsonia, Arkansas. feb

FOR SALE outright or on royalty—Patent for Safety Stop for Cars. For further information apply or write to William Gunter, Federal Hill, Frostburg, Maryland. feb

FOR SALE—Patent No. 918,730, dated April 20, 1909. Door Opener. A device for opening doors with the foot. Can be attached to any door having a common lock. A useful article and should have an extensive sale. Want correspondence with honest men or manufacturers to place door opener on the market. Will sell outright or part interest at reasonable price. Address, K. I. Bronson, R. R. No 1, Rice Lake, Wisc. feb

FOR SALE—Patent No. 929,478, issued July 27, 1909. Alarm for Boilers. For terms address, Ernest Parish, R. F. D, No 2, Milford, N. Y. jan

FOR SALE—Wonder Rupture Truss and Bandage. Can be worn day and night. Can sleep in it. No torture, sure fit. Patent just out. Order from J. F. Cruff, Box 235, Providence, R. I. jan

FOR SALE—Patent No. 893,309, issued July 14, 1908. A torch to ignite blast fuses. When lit with a match cannot be blown out. Will dispose outright on liberal terms. Address, John Craighton, Deer Lodge, Montana. jan

FOR SALE—Patent No. 893,213, issued July 14, 1908. Respirator. A great benefit to consumptives, mine, mill and metal workers. Can be cheaply manufactured. Will sell cheaply or on royalty. Address, W. T. Whiteway, Grand Falls, Newfoundland. jan

FOR SALE—Patent No. 934,259. Oil can. Will come into universal use. Very cheap to make and effective in use. Will oil every time and no excess of oil to soil machinery or fabric. Address, H. J. Allen, 2310 E. Beach St., Biloxi, Miss. jan

FOR SALE—Patent No. 902,746, issued Nov. 3, 1908. Self-fastening Hook-and-Eye; no sewing, quickly attached, can be used wherever ordinary hooks-and-eyes are used, cheap to manufacture. Will sell for $800. Address, Harriet N. Legan, 677 South Pennsylvania Street, Denver, Colorado. dec

FOR SALE—U. S. Patent No. 927,356. Also Canada and Great Britain patent rights. Wonderful heating drum, throws all the heat down, absolutely no odors; burns half the gas of any stove of its size known. Will sell one or all three patents. For description, illustration, etc. Address, Dr. W. S. Keyser, Everett, Wash. feb

FOR SALE—Patent No. 917,951. Bit. Calf, colt, cow weaner. Will sell right. The present invention inserted in the mouth of the animal suffering with bloat will save it from dying. Address, J. C. Krause, Bessie, Okla. feb

FOR SALE—Patent No. 925,638. Every manufacturer ought to know what the old original shoe-calk did for its manufacturer. I have the new improved shoe calk. Manufacturers do you know what that means for you! Address, P. O. Box 405 Davis, W. Va. dec

FOR SALE—Patent No. 923,969. A clamp gage and brace for use at the joints of railroad track. Especially useful at curves and switches. This device will hold the track for all time to come, Address, J. J. Griffin, Sparks, Georgia. dec

FOR SALE—Patent right covering Hitching Strap, No. 927,275, issued July 6, 1909. Splendid device, simple and convenient. Will sell itself when once demonstrated. Address, V. O. Parker, No. 11 E, Martin St., Raleigh, N. C. dec

FOR SALE—Two Patents on Trunk-Tray Form, U. S. Patent No. 870,949, issued Nov. 12, 1907, Canadian Patent No. 116,503, issued Feb. 9, 1909. This is a great labor saving device. Will accept the first reasonable offer. Address, Walter S. Gilson, 347 S. State St., Chicago, Ill.

FOR SALE—Patent on Time and Interest Calculating Sheets. The simplest and most available means ever devised for reckoning time and interest. Costs little to make and could be sold freely at handsome profit. A money-maker. For sale, cash or royalty. Address, Walter Sparklin, Petersburg, Va. dec

FOR SALE—Patent No. 899,489, dated Sept. 22, 1908. Pick Ax Guard. A device that is much needed in rock work and coal mines. Saves the handle from wearing out and keeps it solid in eye of pick. A simple working device. Cannot be a better one invented. Would like to hear from any one who buys patents. Address, T. W. Gordon, East Franklin, Maine. feb '10

FOR SALE—Patent No. 620,239, issued May 4, 1909. Mail Receiver and Deliverer. Will sell outright at a reasonable price. For particulars, address Joseph O. Anderson, Bercail, Mont. mar '10

FOR SALE—Patent on a small device which can be manufactured for less than fifty cents, and is a useful labor-saver which ought to be used over a wide territory. Address, N. W. Parker, Granville, New York. dec

FOR SALE—Patent No. 923,166, issued June 1, 1909. Skirt Maker. Outright or on royalty. Let me send you cut or make me an offer. Miss Delia Goodale, 128 Remington St., Fort Collins, Colo. dec

FOR SALE—Patent No. 924,514, dated June 8, 1909. This is a great money saving device for railroads. No more batted joints. Will greatly increase the life of rails. Will sell outright or on royalty basis. Address, John Warchock, Box 43, Seney, Mich. feb '10

FOR SALE—Double acting gas engine. Simplicity itself. Double power. Saves fuel. Mechanics will recognize this as a great stride in gas engine improvements. Will consider royalty. Address, G. H. Marquardt, South Haven, Kansas. dec

FOR SALE—U. S. Patent No. 893,193. Automatic Valveless Wheel Flange Oiler for oiling the curved rails of street railways, which work is now done by hand. This invention is simplicity itself. Can be manufactured for $1.00 each. Two are required on a car. In a working test on a street car it has proved a thorough success. Address, F. G. Phillips, No. 1614 Keefer St., Vancouver, B. C., Canada. dec

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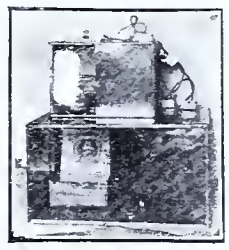
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WASHINGTON, D. C., DECEMBER 1, 1909.

Report of Commissioner of Patents.

In the last report of the Commissioner of Patents for the fiscal year ended June 30, just published, the perennial recommendations as to the necessity for additional room, a new building for the Office, etc. are renewed. There has been the usual annual increase in the volume of business during the period under review, 35,000 patents, in round numbers, having been granted, with some 63,000 applications, an increase of upwards of 5000 cases over the previous year. The law to consolidate the acts respecting copyrights, which became effective July 1, 1909, repealed an act permitting the registration of labels and prints. Consequently, since the date last mentioned there have been no certificates of registration of prints and labels issued. The money receipts were $1,976,000, and the expenditures about $1,887,000, leaving a net surplus of some $88,000. The grand total of receipts over expenditures for maintaining the Office from 1836, when it was established, to date, is over $7,000,000, and it goes on increasing from year to year. This vast sum represents the earnings of the Patent Office, and it is therefore more than self-supporting—a unique position for a government bureau. The work is growing so rapidly, and the need for additional room is so imperative, that it can be a question of only a few years before it will be necessary to erect a new building to accommodate the Patent Office. The Commissioner says, in part:

"Patents for new inventions should be issued with the utmost promptness after the application for patent has been filed, for such inventions form the basis of vast industries, which inure not merely to the profit of the inventor, but to the benefit of the manufacturer, the laborer, the trader, the professional man, and the consumer, and to the commercial interests of the country in general. Great Britain and Germany have each recognized the necessity of providing ample facilities for the work of their patent bureaus, and have each recently erected new buildings, which are in every way more commodious and better adapted for the business of a patent office than the building which now houses the United States Patent Office, although the patent business of each of those countries is small when compared with that transacted in the United States Patent Office.

"The Scientific Library is at present in a very crowded condition. More shelving space and additional steel stacks are now required to accommodate the books in possession of the library, and still further space will be required for the volumes which are being constantly purchased out of the annual appropriation, as well as additional shelving for the foreign patents, which are increasing at a rapid rate each year. For example, Austria publishes about 32 volumes per annum, France 50, Germany 150, and Great Britain about the same number. In order to provide for present conditions and for the increase in the next five years, I recommend that Congress be asked to appropriate $2000, or so much thereof as may be necessary, for this purpose.

"The classification of patents is progressing as rapidly as could be expected with the force available for that purpose. There are now over 930,000 United States patents, approximately half of which have been reclassified, and over 2,000,000 foreign patents, aside from the subject matter embraced in nearly 90,000 volumes of the scientific library, which remain to be classified and digested. When this work is accomplished, the labor and expense of examination will be lessened by nearly one-third and the validity of the patents issued thereafter will be better insured. It is impossible, because of the lack of room, as well as of the lack of force, to detail as many Examiners for this work as would be desirable: but it is believed that a small additional force should be provided for this purpose."

The Commissioner urges legislation which would result in the establishment of a patent bar, and reports the treaty with Germany to which we referred in the last issue of the INVENTIVE AGE. This treaty practically assures to American inventors protection of their rights in Germany if the patent is manufactured in America—a relatively simple matter. Negotiations are pending with nearly all the European states for the promulgation of treaties of the same character, and these, if concluded, will greatly extend the protection to inventors and to the industrial interests of this country, as well as to those of the nations with which such arrangements may be made.

The meeting of the International Convention for the Protection of Industrial Property, which will be held at Berne, Switzerland, in May, 1911, is most important, says the Commissioner, to the interests of American manufacturers. The 21 nations which are adherents will be represented by delegates, and other civilized nations will be invited to send representatives. A strong effort will be made to harmonize the laws relating to patents and trademarks throughout the world, so as to give adequate protection to all inventors.

The passage of the bill introduced into the last Congress, for the purpose of safeguarding applications from possible mutilation or fraudulent amendment during their pendency in the Office, is also urged. It provides that there shall be filed with each application, in addition to the drawing, two photographic copies of the latter. The purpose is to enable the detection of unauthorized changes in the original drawing, or the abstraction of such drawing and substitution of another: and also to lessen the danger of serious mistakes on the part of the Office in failing to detect interferences between co-pending applications for the same inventions. One of these copies is to be filed in the secret archives, to serve as a permanent standard of comparison with the drawing, which latter is sent to the attorneys' room when required, and may be changed by any corrupt employee in the Office, leaving no evidence, or at best mere negative indications, that alterations have been made. The second photographic copy will be retained in the file-wrapper and sent to the attorneys' room upon order, or to any other division of the Office. Sometimes patent drawings are kept out of the archives for extended periods, amounting in interference proceedings to years. While the drawing is thus absent, interferences between the application of which it forms a part and other subsequently filed applications may be overlooked, as the interference search is made by means of the drawing.

The following extracts are made from the report:

"I desire to repeat the recommendation made in my last report in reference to the elimination of one of the appeals in this Office. Under the present patent law, appeal lies in *ex parte* cases from a Primary Examiner to the Board of Examiners in Chief, thence to the Commissioner and from his discision to the Court of Appeals of the District of Columbia, and in interference cases the course of appeals from decisions of the Examiner of Interferences is the same, there being three appeals in each case.

The purpose of the proposed amendment to the statute is to shorten the course of prosecution by the elimination of one of the appeals within the Office. This is designed to be accomplished by combining the Commissioner, First Assistant Commissioner, Assistant Commissioner and Examiners in Chief into a single appellate tribunal, any three of whom shall constitute a quorum, to which all appeals shall lie, whether from a Primary Examiner or from the Examiner of Interferences, and from which appeals would lie to the Court of Appeals of the District of Columbia.

The present course of appeals is not well adapted to the volume of business which the Office is now called upon to handle, for the following reasons:

1. It imposes on applicants an unnecessary amount of delay and expense. The very purpose of the patent system is to place at the service of the public, at as early a date as practicable, inventions as they are made, and unnecessary delays affect not only applicants but all interested in the industries to which the inventions relate. One appeal within the Office, together with the appeal to the Court of Appeals of the District of Columbia, would seem to be ample, especially in view of the fact that in a suit on a patent, a single appeal takes the case from the trial court to the court of appeals. The elimination of one appeal would materially shorten the time required for the ultimate disposal of appealed cases and effect a considerable saving of expense to applicants.

2. Section 4910 provides for an appeal to the Commissioner in person from the Board of Examiners-in-Chief. The work of the Office and the consequent number of appeals have increased to such an extent that it has become difficult, and will soon be impossible, for the Commissioner to give to each case the amount of personal attention proper to its disposal.

3. The Board of Examiners-in-Chief as at present constituted consists of three members, and no provision is made under the present law to supply a temporary vacancy caused by the sickness, or absence from other cause, of any of the members. The absence of one member often results in an evenly divided board, with the consequent necessity for a rehearing, and the absence of two members causes an entire suspension of business. With the proposed appellate board, the presence of a quorum of three would be practically assured at all times, which has not been the case in numerous instances in the past, owing to absences of a member of the Board on account of illness. The work of this tribunal has so greatly increased during the last few years that it is almost impossible for its members to give the thorough joint consideration to each case which it deserves.

These changes of the course of appeals would not only have the effect of expediting the prosecution of applications on appeal, but the elimination of an appeal would be a saving to the inventors of one appeal fee, the attorneys' fees, and other expenses incident thereto. Furthermore, having but one appeal within the Office in lieu of two would result in giving greater stability to the decisions of the office tribunals, and would also obviate any want of comity that has at times existed in the past between the decisions of the Commissioner of Patents and the Assistant Commissioner."

To keep themselves posted in the progress of the arts in which they are interested, inventors and manufacturers should subscribe for the INVENTIVE AGE, which publishes a list of all patents issued each month. The low subscription price and the character of the publication entitle it to the support of all the inventors of the country.

SCIENTIFIC PROGRESS.

Smokeless Powder.

Two such apparently different articles as artificial silk and smokeless powder are made from the same basis—collodion wool. Since smokeless powder is to be universally employed in the wars of the future, it is of interest to know how it is made. Collodion wool is manipulated with a mixture of cotton and sulphuric acid, which changes it into gun wool, the basis for the celluloid employed in the manufacture of smokeless powder. Such improvements in the apparatus have been made that it is possible to convert all the ingredients into the finished powder within an hour.

Automobile Hearse.

In order to dispense with the inconveniences and complications of transporting coffins by railway, an automobile hearse has been invented. This apparatus, for which credit is due to a Paris undertaker, is so arranged that the coffin is stored in the rear part of the automobile, while the mourners are accomodated on seats provided in front and can thus accompany the remains. The car is of 24-horsepower, and has a speed of from 30 to 35 miles an hour. Commenting upon this device, a facetious writer in *Popular Mechanics* says that the fanatic sportsman can therefore in the future be buried at a speed of 30 miles an hour.

Disinfecting Sewers.

A novel and extremely simple way of disinfecting sewers has been tried in our northern cities. It has been found that ordinary gas lights are destructive of the germs in sewer gas. The lamp posts are placed near the manholes of the sewer, and are connected with the same by means of a pipe. This serves to carry the sewer gas to the enveloped gas burner, where the flame effectively burns and disinfects the gas as it passes through. To show how satisfactorily the system works, plates containing culture media were exposed to the sewer gas both before and after it had passed through the lamp. Not a single growth of bacteria was discovered on the plates exposed to the sewer air after it had passed through the flame: but on the plates exposed to the same gas before passing through the burner, over three hundred germs were found.

New Application of Concrete.

King Concrete has been found to be most adaptable and versatile, and it has been taking the place of wood in many directions; but it remained for a Frenchman to reproduce timber in its original form in concrete. He owns a beautiful estate near Malmaison, and it was desired to erect an electric plant in the park. The problem arose how to build a smoke stack among the fine old trees without marring the harmony of the scene. The French temperament is essentially artistic, and it was finally decided to mold the concrete into the form of a tree. This was accordingly done, and what appears to be an old monarch of the forest is really a reinforced concrete stack. The rough bark, various excrescences on the sturdy trunk, even the apparent remnants of a few broken limbs, are all shown with a fidelity to nature that completely deceives the casual eye, although the expert forester might well be puzzled, at first glance, to decide the species of this addition to the plant life of the country.

Moving Pictures.

The mushroom like growth of the moving picture industry in this country is indicated by the estimate that 4,000,000 people were in attendance on the shows every day last year. Over $50,000,000 is invested in them, and 190 miles of films are exhibited every day. This work, too, is extending from amusement enterprises to commercial fields. A Massachusetts shoe concern recently had a series of pictures taken of its process of manufacture, and shown in various towns as a method of advertising. There was a perceptible increase in business in every place where the pictures were exhibited. Another instance, of the entrance of the moving picture into the commercial world, says an article quoted in the *Literary Digest*, is connected with the recent installation of glass blowing machines in some of the large glass works in the West. At the time of the formation of the company for the manufacture of these machines, endeavors were made to get foreign capital interested in the project. Bankers abroad sent representatives here to see the machines, but when they returned home their employers absolutely refused to believe that there was a machine that could blow glass automatically. It was practically impossible to ship the machine abroad, as it was liable to be broken. It was decided therefore to have a series of moving pictures taken, showing the *modus operandi* of the machine. These were sent abroad, and the result was the immediate acquisition of foreign capital for the promotion of the company.

The machine that takes the photographs looks like an enlarged camera, with a handle protruding from the side. Into the camera is placed a roll of film. usually between 800 and 1,000 feet in length. The film is perforated on the sides and leads out of the container to the top of the camera, from which it is drawn down over the lens by means of metal pawls. These pawls draw down a section, about one inch high, before the camera when the shutter is automatically opened, allowing the film to receive the action of the light. The shutter then closes, and while closed the pawls bring down another section of the film. The movement, however, is so rapid that several hundred feet of these pictures may be taken in a few minutes. The film goes back into the container, which is light proof, and automatically closes when the end of the film is reached. It is then taken to the developing room.

In this room there are shallow porcelain tubs, about 4 feet wide and 8 inches deep. On top of these baths a drum is placed, which is revolved by means of a small motor. About six inches of developer is placed in the bottom of the bath, so that a portion of the revolving drum is in it all the time. The film is then spirally wound on the drum, the power is turned on, and the process of developing commences. When sufficiently developed the drum is taken to a clear water bath for a few minutes, and then put into the fixing bath. When finished it is placed on the wooden corrugated drum and dried. This makes the negative, and the positive is prepared in much the same manner as ordinary printing from a glass plate. The film is exposed in direct contact with the negative, and the positive is developed in the same way as the negative. The film is then ready for reproduction.

From the studio this is sent to a film exchange or depot, where exhibitors may secure new films for those already used. A film costs about $115, and it is rented at the rate of $20 a week for a new one, and less for those that have been exhibited.

Electric Surgery.

Before the electric motor was added to the surgeon's equipment, most of the operations were performed by the old chisel and mallet plan, and by hand operated instruments. The advantages to be derived from power-driven cutting tools are apparent even to the layman, especially in such operations as trephining. A motor operated outfit described in *Popular Electricity*, is well adapted to operations upon the bony structures, as it is at all time under perfect control, and greatly shortens the time of, and simplifies, operations. It is of special advantage in cases where it is necessary to open the brain case, remove necrotic portions of bones, etc. The motor is capable of developing one-fifth horse power, and is specially wound for the purpose. As accurate control is essential, a regulator is provided. The various cutting tools are operated by a flexible shaft connected directly with the motor shaft. The hand piece for holding them may be easily sterilized, which is an important feature.

All kinds of cutting instruments may be attached to this motor: little drills for making holes in bones in order to wire them together; trephines for opening the skull; burs which will penetrate bone readily: devices for cleaning cavities, etc. A special electric knife is a marvel of modern surgery. A blade without a cutting edge, of a form similar to the common probe, is fastened to one end of a six-inch glass rod, through the center of which passes a conducting wire. A high frequency current is employed, and when this is turned on, a noiseless spark half an inch long appears from the point of the knife. The spark cuts the soft tissues with the same ease as hot steel goes through butter, without any apparent cauterization. Experiments so far have shown that this method causes a more profuse hemorrhage, but on the other hand the instrument sterilizes as it cuts, and it also requires no sharpening.

The City of the Future.

In a recent popular magazine, Hudson Maxim writes entertainingly in regard to the cities of the future. Man's millenium, he predicts, will be machine made. Our much vaunted sky-scrapers will be as log huts beside the monumental structures of our grandchildren. Instead of individual buildings, independent in architecture, the city will be as one enormous edifice, with banks of streets, arcades and corridors rising one above the other, supported by vast columns several blocks in diameter at the base. Viewed from a distance, the whole will have the aspect of a frail structure of webs of steel, through which the sun and air will find a freer access to the earth than they now find between city walls. This forecast may be exaggerated: but those who watch the tendency toward concentration of population in our metropolis and the steady advance in height of our buildings, believe that the solution of the problem of housing will come in some such way. A writer in *Popular Electricity* indulges in similar visions. The enormous buildings of the future, he predicts, will be equipped with rolling and moving floors. Express elevators will run from the basement to the topmost stories. and accomodations will serve those who wish to stop at intermediate floors. Each building has on one of the stories of the basement, a central postoffice, connected with the private offices by tubes which carry the mails; also an automatic telephone central. On another floor are the great safety deposit vaults—"the most perfect safes the human brain can devise." First a man has to know the number of a combination lock before he can enter his compartment. Then he has to unlock another combination in order to be able to unfasten the first door. As soon as the vault is opened, an electric apparatus gives a signal to the vault controlling office. His picture is thus transmitted, and an indicator shows the photograph of the person who is authorized to enter the vault. The operator compares the two, and if the person is "all right," he turns on the electric current which allows the party to use the first key. This done, a red light appears in the office, showing that the party had the right key. Immediately an alternating current is thrown in, permitting the party to use the second key, with which he is able to finally open the vault. Electric radiographs show in the central office all valuables which the man puts in or removes from the vault.

On another story of the basement are the electrical machines, adapted not only to heat and light the building, run the elevators, etc., but to purify the air in the different rooms, and also to clean the drinking water. Some of the apparatus produce different colors of light, and all the illuminants used burn with cold flames. The lamps have no filament and do not need wires attached to them. They may be carried around in the whole building, always lighted. There is also an electric cafe, where the entire service is automatic. Transportation is of course to be chiefly aerial. At the present rate of progress, the dweller on the earth in the year 2000 may witness such marvels.

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Churn....C. M. Long
Cigarette-box....S. A. Spanziante
Cipher systems, Apparatus for use in connection with check..H. C. Newton and A. G. M. Michell
Circuit-controlling mechanism....M. W. Day
Clamp....J. P. Lawrence
Clutch for transom-rods....N. G. Pilcher
Coal-hod....A. T. Robinson
Coaster-brake....P. P. O'Horo
Cock, Ball-....E. S. Stack
Coffee-mill....M. Holl
Coking process....L. L. Summers
Commutator....W. A. Dick
Compasses....L. Harris
Composing-machines, Galley mechanism for typographical....H. Pearce and J. E. Billington
Concentrator and classifier, Centrifugal..F. Laist
Condenser....E. N. Woodruff
Coop or crate, Folding....F. T. Wing
Corn-hanger....E. F. Swanson
Cotton-choppers, Caster-wheel for...J. W. Garret
Cotton-grader....L. A. Greene
Cotton-picker....D. M. Bailey
Cotton-press....F. E. Thomas
Coupling....A. H. Harris
Crank, Varible-throw....G. R. Grout
Cream-separator....G. N. Wolf
Culinary utensil....D. H. Coles
Cultivator....E. B. Fitzgerald
Cultivator, 2 pat....C. Gardner
Cultivator....A. Benton and C. D. Jordan
Cultivator, Disk....W. L. Clevenger
Culvert-mold...W. C. Fife and S. R. Coleman
Current motor, Alternating-..A. C. and T. R. Bell
Curtain-rod fixture....L. K. Brigham
Cuspidor, Railway-....W. Hill
Cutter-guard....P. Foster
Damper-regulator.R. P. Mitchell and R.V.Brawley
Davit-lock....W. J. Ryan and L. Tanning
Dental and like instruments, Rack or tray for....W. L. Smith
Dental and like tools, Rack for....W. L. Smith
Die and die-support....W. D. Coolidge
Dish-washing device....M. Froese
Dispensing-machine....P. C. Petersen
Display or show case....W. Freeman
Displaying apparatus, Sample-....G. E. Fariss
Ditching and grading machine....W. I. Short
Door-opening apparatus, Automatic.L.Effenberger
Door-operating means..W. R. Rogers and C. Vogel
Door-stop....F. M. Mosier
Draft appliance....W. W. Winger
Draft-equalizer....F. E. Travis
Draft-hook....D. P. Springer
Draft-riggings, Machine for testing and registering operation of....J. F. O'Connor
Draft-sill....J. Acker and C. L. Bundy
Dredgers, excavators, &c., Tooth for steam....C. E. Gardner
Drill-holder....A. H. Knight
Drill-support, Electromagnetic....G. Boenig
Drilling-machine table....A. Davis
Drilling-machines, Material-holder for..S.P.French
Drip-pan....M. C. Smythe
Dry separator....R. R. Snowden
Duplicating or printing machine....J. D. Havens and H. M. Page
Dust-collector....G. Szesny
Dust through the application to roads, or road material of an aqueous emulsion of oil, Prevent ing and laying of, reissue....W. M. Sandison
Dye, Azo....O. Gunther and L. Hesse, *et al.*
Dye, Sulfur....J. Flachslaender
Dye, Vat....J. Deinet
Dye, Yellow....O. Gunther and L. Hesse
Dye, Yellow azo....O. Gunther and L. Hesse
Dyes and making them, Pyrazolone....P. Julius and E. Fussenegger
Educational device....A. C. Immer
Egg-beater....F. P. Burr
Electric distribution....J. L. Creveling
Electric fixtures, Outlet-box for....O. F. Erickson and R. H. Bradshaw
Electric furnace....A. Reynolds
Electric-light flasher, Automatic....J. O. Houser
Electric-light hanger, Adjustable....L. Buendert
Electric outlet boxes, Hanger for...A. McMurtrie
Electric-shade holder....E. F. Gennert
Electric switch....J. G. Peterson
Electrode, Storage-battery....L. H. Flanders
Electrodes for electrolytical purposes, Making durable carbon...G. Adolph and A. Pietzsch
Elevator....W. T. Long
Elevator-door-operating device....C. L. Gruhn
Elevator-gate lock, Automatic....E. F. Joyce
Elevator safety-brake,Automatic..L. Givulinovich
End-gate....C. Schallau, *et al*
Engines, Device for barring-over....C. E. Sargent
Engines, Dynamometer thermo-couple for explosion-....N. M. Hopkins
Envelop, Safety-....R. Z. Nyce
Explosive compound....F. H. Briggs
Extension-table, 2 pat....E. L. Marston
Fan, Rotary....J. Keith
Fare indicator and register....H. E. Sayer
Fence....T. W. King
Fence-stretcher....M. E. Johnson
Fence-wire-releasing device....F. Cummings
Fertilizer-distributer....J. H. Bloom
Filling and capping apparatus....J. F. Heybach
Filter....D. W. Field
Filtering apparatus....D. Diver
Finishing process....H. L. Haskell
Fire-escape....W. Craine, *et al.*
Fire-extinguishers, Sprinkler-head for automatic..M. K. Hopkins
Fire-resisting shutter and slat therefor, Flexible...E. H. McCloud
Fire-shield, Collapsible....J. A. Dennis
Firearm....A. Fyrberg, *et al.*
Firearm, Repeating....G. S. Lewis
Firearms, Recoil-pad for....M. B. Parker
Fish-scaling machine....A. Grub
Floor-drain....G. J. Dehn
Floor-scraper....F. M. Israel
Flooring and ceiling, Interlocking....J. W. Piver
Flue-expander....J. P. High
Flushing-cistern for closet-bowls....J. H. Van Zandt and W. E. Thacher
Flushing-tanks, Float-ball for....T. Zwermann
Flying-machine....A. R. Malasomma, *et al.*
Form locking and adjusting device..E. I. Manent
Fruit-washer....C. H. Hallauer
Furnaces and converters, Operating blast-....J. Gayley
Fuse for projectiles, Safety percussion-....D. J. Cartwright
Game apparatus....F. Dando, *et al.*
Garden implement....W. C. Doidge
Garment, Bifurcated....F. F. Lewis
Garment-fastener....C. H. Schmidt
Gas and air for illuminating purposes, Manufacture of a mixture of....F. W. Wolff
Gas-engine....J. T. Cowie
Gas-generating apparatus, 2 pat..J. H. Stringham
Gas generator....J. S. Loder
Gas generator, Hydrocarbon-....E. B. Brown
Gas, Making water-....C. E. White
Gasket....C. I. E. Mastin
Gate....A. K. Holdeman, *et al.*
Gate and door....H. P. Latham
Gear-case....G. W. Bandy
Gear mechanism, Sliding-....H. M. Russell, Jr.
Gear, Variable-transmission....J. J. Knecht
Generators to secure constant potential, Device for regulating the speed of....A. L. Parker
Glass-cutting table..J. G. Green and V. A. Henry
Glove....G. C. Fried
Governor....G. G. Wilson
Grain-bin....A. N. Eaton
Grain-separator....G. E. Armold
Graphite article and making same..A.M.Williamson
Grinding apparatus, Tool-....G. W. Riddle
Grubbing implement....L. P. Harvey
Gun with recoiling barrel....E. Olsson
Hame-clip....W. A. Wilson
Hammock-frame, Collapsible or folding....K. L. Hyller
Hammock-supporting frame....M. D. Wolf
Hand-wheel....A. Hallowell
Harness attachment....P. M. Stevens
Hat-frames, Device for forming wire....W. M. Jameson
Hat-ventilating attachment....C. A. H. Smith
Hatch-cover....G. H. Tackman
Hay-press....M. A. Westbrook
Headlight attachment....F. J. Pfister
Heater....T. J. Bartow
Heaters, Injector for hot-water...J. W. Guimont
Heel, Cushion-....J. Cairns
Hinge....A. D. Perkins
Hinge, Cover-....C. G. Bloomer, Jr.
Hinge, Segmental....W. Favreau
Hoe, Scuffle-....A. S. Knapp
Hoist, Electric....A. A. C. Gese
Hook and eye....W. Ferris
Hoop-projecting device..C.M and T. Bartholomew
Horse-checking device..A.J. Hobbs and J. R. Jewell
Hose construction....C. M. C. Baird
Hose-coupling....G. A. Anderson
Hose-coupling, Instantaneous....W. J. Casey
Hot-water heater....W. H. Kogle
Hub-attaching device....R. G. Roulstone
Hydrant-casing....J. Day
Hydrant-head, Irrigating....N. S. Twiford
Hydrocarbon-burner....J. Stinbbers
Hygienic heater....H. L. Stutts
Ice-cream freezer, Continuous....H. J. Gerner
Ice-cutting machine....A. J. Offord
Implement-frame....A. G. Dewey
Incandescent bulbs, Capping-machine for....T. J. Hetherington
Incubator, Multiple-compartment....C. E.Adair
Insect-catcher....H. Stranzenbach
Inverted burner....J. J. Weyer
Iron or articles cast from iron, reducing the amount of carbon in cast-....W. Rubel
Ironing-board....M. L. and G. Bacon
Jar-closure....E. W. Pearce
Journal-bearing..J. C. Heron and A. C. Deverell
Key-retaining device..A. Guindon and J. Tyson
Kinematograph apparatus, Driving mechanism for....C. Rossi
Lamp, Electric-arc....A. D. Jones
Lamp, Miner's....O. M. Muller
Lamp-operating mechanism....A. R. Warfield and J. B. Nicholson
Lamp suspension device, Electric-arc-....A. Wunderlich
Lantern-head....A. R. Pritchard
Lard gage-extractor....T. F. Ray, Jr.
Lasting-machine....F. Chase
Lathe....G. W. Davis
Lathe-tool holder....J. D. Ramsey
Lavatory....S. Bedson, *et al.*
Lawn-sprinkler....W. Vossler
Lawn-trimmer....G. H. Person and R. Uhler
Leather-splitting machine....T. H. Mayo
Ledger and file, Combined....L. A. Blochman
Level and gage, Track....C. C. Lynch
Lever, Hand-....R. H. Bowman
Lifting apparatus....T. M. Smith
Liquid-distributing apparatus....C. Potts
Liquid-meter....J. B. Speed and A. E. Wright
Liquids and gases, Apparatus for effecting intimate contact of....S. Hersey and E. W. Blake
Loading and unloading apparatus....B. F. Miller
Loading-fork....R. Pederson
Lock mechanism....M. Farch
Locomotive-boiler superheater....O. W. Ott
Locomotive-superheater....O. W. Ott
Looms, Thin-place-detecting means for....H. L. Freeman
Lubricator....J. Kelly
Magnesium carbonate, Producing....G. Sisson
Mail-bag crane and catcher....J. G. Fleenor, Jr.
Mail-bag-delivery apparatus...J. G. Fleenor, Jr.
Mail-bag lock....G. I. Willett
Mail-box coin-holder, Rural-....G. E. Wemhoff
Mail-box collection-indicator....W. W. Day
Mail-crane, Railway....J. C. Adams
Manure-receptacle....W. H. Hunt
Manure-loader....J. B. Mohan
Marine table....J. H. Jones
Match-box and cigar-cutter, Combined....F. M. Ross and J. A. Ward
Match-box, Safety....J. and W. H. Demaine
Meat-skinning machine....J. O. Williar
Medical irrigator...H. H. Pfeifer and F.M.Towles
Merry-go-round....F. A. Dyson
Metal plates, Apparatus for pickling and washing....G. Mesta
Metal-sawing machine....C. Napier
Metallic compounds, Wet method of separating..J. H. Thwaites
Milk-can, Jacketed....P. Larsen
Milking-machine....W. J. Uebler
Milling machine, Bevel-gear-....P. L. Weston
Milling-machine, Cycloidal....C. Wiebke
Mirror stand or support, Adjustable....G. P. Humphries
Miter-box....J. A. Leland
Mop-making machine....A. Lackey
Motors, Controlling electric....J. L. Routin
Music-stand....M. F. Dougherty
Musical device....J. W. Nunn
Napkin ring and holder, Combined..W. L. Barnard
Nest, Trap-....J. I. Ault
Nozzle, Spray-....P. A. Myers
Oar-blade-forming machine....J. P. Tarbox
Oar-blade-shaping machine....J. P. Tarbox
Oar-rack....E. G. Hodgkins
Oil-burner....W. A. Mack
Oil-burning furnace....C. A. Hammel
Oil-feed for drills....M. Gallowics
Oilstone-holder....F. J. Badge and C. L. Carle
Ore-screen....A. B. Meiklejohn and J. R. Villars
Outlet-box....L. H. Church
Pan cover, Frying-....L. I. Buehl
Paper-cutting device....C. Van Middlesworth
Paper-making system....H. S. Rinker
Paper-roll bracket....S. Wheeler
Paper vessel....C. F. Jenkins
Paper-winding device....H. M. Griffin
Parer, Ear-corn....M. B. Johnson
Pay-station, Automatic....H. W. Hamlin
Pencil-holder....J. W. Myers
Photographic developer....W. F. C. Kelly and J. A. Bentham
Photographic developer....W. F. C. Kelly
Pick....J. A. Gill and C. W. Gates
Picture....C. W. Saalburg
Pipe-joint....R. R. Rust
Pipe-line shafting, Coupling-clamp for..J. E. Jones
Pipe-mold....E. L. Maag
Pipe puller and holder....S. L. Blake
Pitman connection..W. L. Chrysler and J.W. Kays
Planter....H. Smith
Planter, Seed-....G. T. Pine
Plectrum-action....J. Rehbock
Plow, Ditching-....J. M. Cornelius
Plow harrow attachment....S. Seitner, Jr.
Plow-lay holder....J. J. Klein
Plug attachment....C. J. Klein
Pneumatic motor....R. A. Norling
Pocket-knife....E. Mallon
Potato-digger....F. Lesser
Powder-ejector....W. W. Sands
Print developing and washing apparatus....H. C. Gawler
Printer and recorder, Check....W. H. Baur
Printing frame....L. D. Gagne
Printing-machines, Sheet-delivery mechanism for..T. M. North
Printing-plate clamp, Flexible-....J. White
Printing-plate foundation....W. S. Warnock
Printing-press attachment..C. Van Middlesworth
Printing-presses, Construction of reciprocating beds for cylinder....M. Rockstroh
Prismatic and diffusion inclosure....O. A. Mygatt
Propeller, Lifting and driving....R. Strehlau
Pulverizing-machine....W. K. Nix, Jr.
Rack or holder....E. E. Hill and E. S. Gray
Radiator....S. D. Stauffer
Rafting system, Log-....N. C. Elfer
Rail....J. Keeton
Rail-joint....J. F. McGhee
Rail-securing device, Guard-....G. C. Lucas
Rail-securing device, Track-....B. Bourne
Railway-frog....H. K. Hitchcock
Railway-signal....C. W. Coleman, *et al.*
Railway-switch....R. P. Kiblinger
Railway-tie....G. W. Wagner, *et al.*
Railway-tie and cushion....E. H. Johnston
Railway-tie and fastener....E. E. Baker
Railway-trains, Safety-brake apparatus for....D. M. Daley, A. H. Long, and H. L. Maltbie
Ratchet-brace....J. H. McLaughlin, *et al.*
Razor, Safety-....L. Knaster
Receptacle, Metallic....E. R. Williams
Record-holder....W. T. Long
Reflector....L. Zamboni
Reflectors or shades and electric lamps, Means for use in connection with combined..L. Zamboni
Refrigerator, Window-....C. C. Hatcher
Register-securing means..J. J. and S. P. Burgess
Rein-holder and holdback, Combined..C. P. Kertell
Replanter, Corn-....C. A. Lonnecker
Ribbon-shifting mechanism....C. Spiro
Rivet....E. B. Stimpson
Riveting-stake, Adjustable..O., O., and F. Siegler
Rolling tin plates, Apparatus for....C. W. Bray
Roof-guard....S. W. Popel
Roofing and for like uses, Means for retaining and supporting metallic plates for....H. C. Ferron
Rope-slide....C. Harrell
Rotary engine....A. A. McLaren, *et al.*
Rotary steam-engine....J. E. Friend
Rubber....D. Sandmann
Rubber hose, Making....F. J. Gleason
Ruler, Parallel-....F. W. Sterling
Sad-iron heater....J. M. Harper
Sad-iron holder....H. F. Moulden
Safety appliance..Q. T. Howard and W. M. Stark
Sash-fastener....H. B. Sutch
Sash fastener and holder....C. J. Platzer
Sash fastener, Vehicle-....E. R. Mitchell
Saw, Drag-....S. Feller
Saw-tooth shaper, Swaged-....W. R. Anthony
Scale....A. G. Worthington
Screen....C. J. Jewett
Screen-hanger....J. T. Leonard
Screen mounting, Window-....J. F. Beatty
Screw-cutting machine....E. J. Miller
Screw-thread-finishing tool....A. T. Crane
Screw-threading devices, Work-holding means fot....L. F. Hart
Seal and protector for knots....J. Shapiro and N. Komow
Seal-lock....O. Edler
Selective A.C-D.C system....G. H. Hill
Selective A.C.-D.C. system, 2 pat....J. F. Tritle
Self-serving table....F. E. Brunson
Separator-pans, Guide for....L. Meyer
Sewing-machine....H. Dreist
Sewing-machine attachment, Wax-thread-....W. J. Brennan
Shaft-hanger....J. A. Esco
Shearing machine, Sheep-....S. Abeyta
Sheet-feeding machine....R. L. Hanau
Sheet-metal packer....R.Richards,H.P.Marley,V.Kovacs,andA.O.Reves
Sheet-metal shears....C. D. Wagner
Shelving, Revolving inclosed....J. A. Doxtator
Sherardizing, Plant for....W. C. Robinson
Shock-absorber....W. B. Knapp
Shock-absorbing wheel....G. F. Crass
Shoe-support....M. H. Cazier
Shoe-supporting jack....E. A. Stiggins
Show-case and receptacle-cover, Combined....C. A. Piepho
Show or display cases, Apparel-support for....L. G. Dodge
Side-delivery rake....C. E. Blackstone and R. E. Watts
Sifter, 2 pat....F. E. Boyle
Sign, Revolving illuminated....J. E. Saunders
Silk, Treatment of materials containing....T. Boettger and F. Vom Eyser

Silo....D. E. Monta
Skein-holder....F. E. Weightze
Skewer....G. L. Stark and A. W. Baxter
Skip....O. E. Strehlow
Slag-handling table....D. T. Croxton
Sleigh driving-wheel....C. H. C. Hakanson
Snap-hook....A. L. Strohl
Sodium peroxid, Treating....D.E.Parker
Soils, quicksand, &c., Consolidating loose....A. Wolfsholz
Soldering machine, Can-cap-....J. A. Conboie
Speedometer....J. H. and E. W. Bullard
Spring-motor...W. H. O'Bannon and J. M. Field
Stacker, Hay-....J. Dain
Stain-indicator....E. Eckart
Stamping apparatus....K. Hubert
Steam-engine....E. F. Edgar
Steam-trap....C. Stickle
Steaming tray, Food-....G. S. Walker
Steel plates, Treating....C. Davis
Steering mechanism....A. Mauksch
Stereopticon, Dissolving-....C. F. Dutton, Jr.
Stone and stump removing machine.A. Villeneuve
Stone mold, Artificial-....T. V. Galassi
Stove or range top, Kitchen....J. Lauer and J. Demeter
Stoves, Checker-brick for hot-blast..D. Lamond
Straight-edge or ruler....I. Lucas
Street and road building, Composition for binding, surfacing, and resurfacing purposes in.J.H.Amies
Stretcher....F. C. Rheubottom and R. B. Rayner
Submarine operations, Apparatus for. P.E.Galoffre
Switch-stand....J. T. Farrell
Switch-throwing device, Automatic.A. M. Mitchell
Swivel....J. G. Owen
Telegraph-key....G. S. Perry
Telegraphy, Apparatus for wireless, 2 pat....G. Marconi
Telegraphy, Transmitting apparatus for wireless....G. Marconi
Telegraphy, Wireless....W. W. Massie
Telephone apparatus, Coin-freed locking device for....H. Janke
Telephone-exchanges, Apparatus for facilitating communication between...A. T. M. Thomson
Telephone-exchanges, Calling device for....N. E. Norstrom
Telephone-mouthpiece guard....L. H. Webster
Telephone system and the like....R. Hamilton
Telephone system, Lock-out....W. W. Hill
Telephone transmitters or receivers, Antiseptic protector for....F. Schilling
Thermostat, Electric....J. R. Carpenter
Timber felling and sawing machine...J. W. Smith
Time-recorder....C. E. Larrabee
Tinware and for the recovery of solder therefrom, Method and apparatus for cleansing articles of refuse....J. W. Evans
Tire....D. W. McLean, *et al.*
Tire-protective rivet....E. B. Stimpson
Tire, Vehicle-....C. H. Knecht
Tire, Vehicle-wheel....H. M. and T. J. Deeth
Tires, Coupling for the inflating-valves of pneumatic....C. McNellis
Toaster....J. C. Hufman
Tool, Combination-....W. H. Carr
Tool-holding device....G. B. Ford
Toy, Explosive....M. Armstrong
Toy railway-stations, Dome for....H. C. Ives
Traction-engine....J. P. Davis
Tree-cover....W. W. Roberts
Trench-cutting machine....J. Witter
Trenching-machines, Propelling means for....C. W. Rood
Trimming-shears for lawns, hedges, &c.O. Kampfe
Trolley-base...L. F. Mansfield and P. D. Smith
Trolley for traveling cranes....H. W Israel
Trolley switch-plate....E. Heydon
Truck....J. B. Brown
Trunk....W. E. McDermott
Tube-cutters, Feed mechanism for...W. Cushing
Tunnels and similar structures, Air and water tight joint for....A. Lennon
Turbine....V. Peterson, *et al.*
Turbine and internal-combustion motor-engine Combined....J. Hutchings
Turbine, Elastic-fluid, 4 pat....G. Westinghouse
Turbine, Fluid-pressure....G. Westinghouse
Turn-table....R. J. McKelvey
Tympan-frame, Adjustable....C. A. Harris
Type for type-writing and other machines....O. C. Kavle
Type-writer....L. P. Diss
Type-writing machine....E. E. Barney
Underwear....F. F. Lewis
Valve....L. G. McCorry, *et al.*
Valve, Check-....R. F. Kreiter
Valve, Combined pressure-regulating and shut-off....C. D. Miller
Valve for hydrants, stand-pipes, and the like....H. S. Lange
Valve for pneumatic drills, Throttle-.A. Levedahl
Valve, Gas-engine admission-....G. B. Petsche
Valve, Gate-....G. E. R. Rothenbucher
Valve-gear....B. Smart
Valve-gear for elastic-fluid engines, Reversible....R. Hennig
Valve, Globe-....C. E. Fisher
Valve mechanism, Suction-operated...A. Kilborn
Valve, Pressure and vacuum steam-heating....F. C. Goff
Vehicle-coupling....J. R. White
Vehicle gear-casing, Motor-....J. C. Lott
Vehicle, Motor-....A. Loomis, *et al.*
Vehicle mud-guard....H. J. Shrapnel
Vehicle steering-gear....R. H. Bowman
Vehicle steering-gear attachment, Motor-.F. Grime
Vehicle-wheel....D. I. Paisner
Vehicle-wheel, Road-....S. M. Brown
Vehicles, Adjustable gripping-link for..C. A. Case
Vending machine, Stamp-....Z. G. Sholes
Vessel, Paddle-wheel....D. Fletcher
Veterinary obstetrical instrument....C. Gabel
Vulcanizer....H.D.Bultman
Wagon....J. W. Smith
Wagon, Delivery-....F. W. Miller
Wagon-loading device....R. Pederson
Wall blocks, slabs, &c., Machine for molding portable....H. B. Copeland
Washboard....E. A. Hodge
Washboard attachment....T F. Hoban
Washboiler....A. R. Pritchard
Washing-machine....J. D. Williams, *et al.*
Washing-machine gearing, 3 pat....W. Ruthven
Watch-pocket, Vest....L. B. Avery
Watches, Dust-proof sleeve for stem-winding....F. J. Hughes
Water-cooler....A. N. Rose
Water-heater....F. W. Robertshaw
Water-purifying apparatus....J. C. W. Greth
Weighing device....A. C. Mather
Weight-motor....D. D. Spracklen
Welding and brazing tool....R. E. Bruckner
Welding and calking machine....N. B. Robey
Welding-machine, Electrical....W. C. Winfield
Well-drilling, Bull-shaft drum for....J. A. Mauck
Wheel brake, Vehicle-....O. L. Herod
Wheel-guard, Automatic....C.E.. Gierding
Wind instruments, Tone-correcting means for brass....J. Lockhart
Wind-screen....E. K. Conover
Winding machine, Bobbin-....F. La Chapelle
Winding mechanism, Bobbin-....T. G. Plant
Window....W. L. Gillett
Window-lock, Double auotmatic....G. and J. A. Buttress
Wire-drawing machine, 3 pat....H. L. Thompson
Wire fabric for bed-springs and couches. B.H. Jones
Word-meter....H. I. Watts
Wrench....W. G. Dicker, *et al.*
Zinc from solutions of zinc sulfate, Electrolytic winning of....V. Engelhardt and M. Huth

DESIGNS.

Clothes-rack....C. D. Golden
Doily....R. Gair
Scarf-pins and brooches, Clutch for....C. P. Goldsmith

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MECHANICAL PATENTS.

Adding-machine....R. L. Burd
Adjustable stand....T. L. Bacon
Advertising device....T. Kharas
Aerial railway....F. A. Dahlin and E. Carlson
Aeroplane....A. W. Reinoehl
Air-compressor....F. W. Gardner
Air-ship....A. E. G. Lubke
Alloy and its production....A. J. Rossi
Annealing or other like apparatus...W. R. Kinnear
Annunciator, Electric....A. J. Smith
Automobile-protector....D. F. Armstrong
Axes, Combined wedge and balancing-weight for..G. W. Wallace
Bag filling and sealing machine....W. Rulison
Bag-folding machine....T. M. Avery
Bait, Artificial....F. O. Howe
Baling-press....J. W. Burkett
Balls of cast metal, Making hollow....A. Casey
Bank-note tester....I. Cohen
Barbers' chairs, Paper-server for..C. Pfanschmidt
Bathing-suit....H. O. Netz
Baths, Machine for dipping articles into fluid-....H. E. Dill and W. P. Marsh
Bearing for vertical shafts, Ball-....S. S. Eveland
Bearing, Roller side....J. M. Coleman
Bed, Folding....J. McLeland
Beer, Dealcoholizing....F. J. Pribyl
Beer-skimmer....L. F. Martin
Belt controller and tightener....M. J. Davidsen
Belt-holder....A. A. Felix
Beverages, Apparatus for carbonating and dispensing....L. C. Paris and T. Millward
Bill-hook....C. J. Kortz
Binder, Loose-leaf....J. P. Mentzer
Bird-cage and the like....G. M. Porter
Blasting-cartridge....T. Turton
Bleaching, cleansing, and sizing compound....S. A. Flower
Block-signaling system, Electric....W. F. Meschenmoser and C. H. Kinsman
Boat-paddle....C. C. Richardson
Bodkin....E. Case
Boiler....W. A. Nisun
Bolster....H. F. Pope
Book, Duplicate sales-....E. K. Bottle
Book, Triplicating-....H. P. Brown
Boot and shoe machinery, jack....W. C. Evans and E. H. Taylor
Boring-machine feed mechanism....A. Frey
Bottle and other receotacle, Milk-..C. Marthinson
Bottle cap, Non-refillable-....W. F. A. Boyen
Bottle caoping machine....D. S. Yard
Bottle-closure....W. R. Warner
Bottle, Non-refillable....J. G. B. Bloomer
Bottles, Case for vacuum or other...N. Goldberg
Bottling-machine, Rotary....A. A. Pindstofte
Box....J. J. Mitchell
Box-fastener....S. Whitehall
Bracket....F. E. Walden
Brake attachment, Automobile-..J. F. Reifshyder
Brake-equalizer....W. G. Ransom
Brake-hanger....W. S. Adams
Brake-shoe adjuster....O. S. McCurdy
Brush, Electric....M. E. Bacon and L. J. Meller
Brush-holder....S. Nelson
Bucket and lid holder, Sap-....A. L. Milks
Buckle....L. L. Thomas
Building construction, Studding-clip for. M.Rittler
Cabinet for dispensing toilet-paper...A. H. Scott
Cake-coating machine....P. D. Harton and C. F. Crelier
Calipers....O. F. Olson
Can-opener....C. B. Rigg
Caoutchouc, gutta-percha, and similar substances, Apparatus for washing....F. Kempter
Car body-bolster....H. F. Pope
Car-coupling....W. S. Schroeder
Car-door....D. S. Bailey
Car-fender....A. J. Thornley
Car, Freight-....R. V. Sage
Car, Passenger-....F. H. Lincoln, *et al.*
Car, Railway-....E. A. Barber, *et al.*
Car-replacer....A. G. Heath and J. W. Howard
Car seat, Railway-..W. R. Smith and J. A. Sanford
Car-turnstile....D. C. Fulton and W. B. Smith
Car-wheel....W. A. Church
Car-wheel-alining means....A. G. Olson
Carbonator....L. W. Silberschmidt
Carbureter....W. K. Bassford, *et al.*
Card-attaching device....F. E. Morrill
Card-exhibitor....F. J. Kilmer and F. A. Henning
Card-fillet tightener....A. A. Cole
Caroet-cleaner, Sanitary....A. J. Meier
Cash-register....E. S. Church, *et al.*
Cash-register and money-changer, Combined....C. A. Grimm
Casket....A. Malinovszky
Cattle-guard....D. A. Prendergast
Center-tube stem-machine....W. N. Packer
Chair and couch, Combined....C. L. Pudrith
Chair attachment....M. A. McClelland
Churn stand and power....W. M. Bates, W. C. Knight, and J. M. Gast
Churn....E. A. Franklin
Cigar-perforator....E. F. Hall
Cigarette-tipping machine....S. Palmowsky
Cigarette-tubes, Making....G. Nast
Clamp....J. H. Umpleby
Clasp....P. M. MacKaskie
Claw-bar....M. Waters
Cleat-joint....S. Whitehall
Clock, Geographical....J. B. Olinger
Clock, Nickel alarm-, 2 pat....E. E. Stockton
Clothes-line attachment....J. H. Thomas
Clothes-pounder....L. E. Van Landingham
Clothes-rack, Folding....E. M. Blanck
Clutch....H. E. Coffin
Clutch, Friction-....W. A. E. Henrici, *et al*
Clutch mechanism....V. J. Emery
Coal-separator....N. Mowery
Comb-rack....A. Vance
Compound gasolene-engine....L. C. Burton
Compressor....W. H. Miller
Concrete-mixer....M. J. Demorest, *et al.*
Concrete-molding machine....J. A. McNamara
Concrete-tile-molding machine....D. Fuhrer
Condenser....F. J. Newton
Conveyer, Gravity-....L. D. Logan
Conveying apparatus....B. R. Adkins and W. Y. Lewis
Cooking apparatus....H. A. Winterknight
Cooking-utensil cover....W. H. Ostrander
Coop and nest, Chicken....H. G. Panton
Cord-clamp....F. Walter
Core-oven....J. J. Johnson
Corset....L. Dziedzic
Cottage construction, Collapsible-....T. Cosgrove
Cotton-chopper....T. J. King
Crankless engine or motor....D. H. Reimers
Crate....D. F. Payne
Crate, Shipping-....G. W. Sharp
Crates and the like, Packing appliance for....M. L. R. Edmunds
Cultivator....C. W. Michael
Culvert, Metal....O. A. Haas
Cushion-edge support....F. H. Hampton
Cut-off and filter for rain-spouts, Automatic....W. S. Bare
Cutting blanks....E. Z. Taylor
Dam for producing power and regulating the depth of water in streams....F. Fredeen
Delivering measured quantities of material, Apparatus for....W. Rulison
Dental or surgical chair....G. Holtz
Directory for commercial buildings and apartment-houses....E. V. Stoddard
Dish-washing machine....M. Curran
Dispensing-receptacle, 2 pat....H. A. Tellerson
Display and packing case, Garment..F. C. Boden
Display-rack....F. E. Bewyer
Distilling apparatus, Water-....W. H. Shepheard
Dividers....J. M. King
Dome-head-cutting machine....J. H. Ames
Door-fastener, Sliding-....E. H. Turcott
Door-operating means, Sliding-....A. Krause
Draft-controlling means and other devices, Mechanism for operating....F. J. Wolf
Draft-regulating apparatus....C. O. Mailloux and H. J. Westover
Draft-regulator....H. D. Frymire, Jr.
Draining device....A. Thompson
Drill-cup cleaner....L. D. Whitney
Dry-cell tester....E. S. Lincoln
Dust-collector....U. Joedicke
Dye and making, Gallocyanin....W. Lommel
Dye and making same, Gallocyanin..W. Lommel
Dye, Azo....P. Volkmann
Dye, Making red azo....E. Ulrichs
Dye, Vat....J. Dein'e, *et al.*
Dye, Yellow azo....P. Volkmann
Eaves-protector....E. P. Ruckle
Eccentrics, Shifting....U. Tremblay
Electric furnace....W. A. Smith
Electric heater. W. A. Rankin and W. M. Harwood
Electric-light cords or cables, Adjuster for....T. A. Parker
Electric machine, Alternating-current dynamo-....C. P. Steinmetz
Electric switch and outlet-box....A. H. Kling
Electrical oscillations, Receiving system for....E. Quack and F. V. D. Woude
Electrolytic apparatus....I. L. Roberts
Elevator safety appliance, Electric-...C. S. Gilbert
Elevator-shafts, False rail for....M. Brown
Embalming apparatus....J. E. Coppola
Embroidery-hoop....H. E Fife
End-gate....O. B. Reynolds
Engine or motor....E. B. Parkhurst
Engines, Combined charging and feeding device for for gasolene-....L. W. Witry
Envelop....G. S. Bauer
Excavator....J. P. Kerr, *et al.*
Exerciser....W. H. Linerode
Extension-rod....C. C. Blake
Fastener, Separable... J. E. and F. W. McConnel
Feed-cutter....W. Thurman
Feed-grinder....F. G. Hobart and W. E. Reuling
Feed-roll....F. T. McDonough
Feed-water heater....J. H. Streich
Feed-water regulator..J. W. Given and J. L. Fogg
Feeding apparatus....A. R. Hoffmann
Fence or other inclosure....A. Josler
Fence, Postless....J. H. Sennstrom
Fences or reinforcing fabrics, Joint for wire....J. F. Gilliland
Finger bar and guard....J. Weigel
Finger-exercising device....C. F. Steckelberg
Finger-head....H. G. and J. H. Frappier
Fire-escape....W. E. Turner, *et al.*
Fire-extinguishing device....J. R. Brown
Firearm, Automatic....T. Martin
Fishing apparatus....J. F. and J. F. Woesley
Floor-dressing machine....O. E. Johnson and E. A. Long
Flushing apparatus....G. Coenen
Fly-excluder and weather strip, Combination....A. B. Clay
Flying-machines, Emergency apparatus for controlling....J. Means
Folding box....C. H. Seegmiller
Folding fender, Automatic....W. J. Hickey
Folding-machine, 4 pat....G. J. Dormandy
Folding table....F. W. Gent
Foot-supporter....C. E. Passage
Fuel and gas from peat, Apparatus for producing..W. L. Shepard
Fuel-regulation system....H. Lemp
Fuel-treating composition....E. H. Ellis
Funnel-separator....O. Zerkowitz
Furnace....A. G. Ingalls
Furnace terminal, Electric-....E. C. Speiden
Furnaces, Fuel-feeder for....E. T. Winkler
Furniture-coverings, Attachment for holding....M. Douglas
Fuse, Electrical....A. G. Fay
Fused and solid terminal, Reversible....R. H. Conway and H. E. Bisbing
Game apparatus....J. Grundy, *et al.*
Garbage-receptacle....G. A. Mauller
Gas apparatus....J. F. Beals
Gas, Apparatus for the manufacture of....W. H. Morgan and J. Bensley
Gas burner, Acetylene-....A. Bray
Gas-burners at given hours, Device for lighting and extinguishing....E. de Gounevitch
Gas cut-off, Automatic....R. F. Ainsworth
Gas-main....M. G. Moore and R. C. Glazier
Gas-mantles, Manufacture of incandescent....A. Simonini
Gaseous-fluid compressor....D. E. Haire
Gate....G. B. Garwood, *et al.*
Gear-wheels, Manufacture of....F. A. Brun
Gearing....H. Wolke
Gearing, Reversing-....C. R. Alsop
Glass fastener, Window-....C. W. Phinny
Glass-forming machinery....W. W. W. Keyes
Glass beating and drawing furnace....U. Houze
Granular materials, Apparatus for screening, sizing, and classifying....C. A. Pringle
Grape-picking device....G. F. Morse
Grinder, Sausage-meat-cutter....J. N. Bechard
Gun practice, Apparatus for teaching. J. Whiteside
Gun-sight, Auxiliary....J. Potter
Hair-pin....C. A. Dunbar
Hammer, Pneumatic....W. Baxter, Jr.
Harrow scraper, Disk-....F. B. Niesz
Harvester....R. Y. Gregg
Hat attachment....A. D. Glascock
Hats, Ventilator and medicament or perfume container for....H. D. Barnes
Hay-loader....L. H. Frazer
Hay-loader....L. Howe
Headlight, Dirigible....J. H. Baum
Headlight, Locomotive-. I.L Wade and W. L. Smith
Heater....E. J., C. A., and C. H. Droz
Heating apparatus....G. B. Collier
Heating system, Steam-....D. Broadbelt
Heel, Detachable....E.Rennie
High-speed brake....W. V. Turner
Hinge, Spring-....W. P. Collins
Hoe....H. W. Richards
Hopper and feeding device....J. E. Perrault
Horse-releaser....J. A. Hockett
Hose-coupling....J. F. Hinck
Hydrant....W. K. Palmer
Hydraulic pressure, Apparatus for generating and applying....J. W. Nelson
Hydrogen-sulfid generator....E. L. Ross
Ice-cream freezer....H. Viedt
Ice-creeper....S. Kossier
Ice-edger....O. W. Robins
Ice in cans, Apparatus for making clear. F. A. Rider
Ice-machine cut-off device....R. Whitaker
Ice-sawing machine....A. L. Stauffer
Incubator....A. M. Shaul
Invalids, Mechanism for elevating....R. L. Floyd
Ironing-board....J. Hovsepian
Jacquards without pattern-cards, Mechanism for electrically operating....A. Regal
Joints, Making interlocking....M. Guett
Journal-box....P. J. Harrigan
Kettle-hanger....H. C. Cramer
Knitting machine, Automatic circular-....J. D. Hemphill
Knockdown table....F. J. Mauborgne
Ladder....J. Coplinky
Lamp, Arc-....J. T. H. Demster, *et al.*
Lamp, Inverted gas-....C. L. Duenkel
Lamp-sockets, &c., Strain-relieving means for terminals of....F. A. Swan
Last, Hinged....E. O. Krentler
Last, Locking-....F. W. Kittlinger
Latch, Automatic door-....J. J. Tatum
Latch, Door-....E. L. Bowes
Lathes, Interchangeable spring tool-holder for....H. A. Hillenbrand
Level attachment, Spirit-....W. C. Oswald
Life-buoy....T. E. Williams
Linotype-machine matrix....J. E. Billington and C. Holliwell
Lithium compounds, Manufacture of pure..E. Zell
Lock, 2 pat....H. F. Keil
Lock indicator, Door-....A. Arens and El L. Teich
Locomotive....S. M. Vauclain
Locomotive recording instruments, Gearing for....S. T. Park and J. E. Phillips
Logs, Apparatus for injecting chemicals into....W. G. Born
Loom....F. A. Mills
Loom, Automatic weft-replenishing..R. Crompton
Loom-dobby....A. A. Gordon, Jr., *et al.*
Loom-harness motion....H. Le Doux
Loom, Weft-replenishing....P. Macpherson, *et al.*
Lubricator....W. O. Turner
Magnesium, Production of....F. von Kugelgen and G.O.Seward
Mail-bag deliverer....B. F. Troup
Mail-bag hanger....W. M. Corthell
Mail-box....F. H. Sieh and F. J. Lowe, *et al.*
Mail-box support....J. M. Watson
Malt-making apparatus....G. J. Meyer
Massage-vibrator....E. Falbsbender
Match-making-machine attachment...J. E. State
Measuring device for window-shade machines....E. O. Engberg
Measuring instrument....W. P. Phenix
Meat curing and smoking apparatus. L. Bloomberg
Meat-tenderer and vegetable-chopper. M. H. Tyler
Metal chips and apparatus therefor, Process for melting....W. F. Prince
Metallic-plate-edging machine....J. Fraser and T. Gray
Metallic tie and rail-fastener....O. A. Storaasli
Metallurgical process....O. B. Dawson
Meter-loop, Inclosed....E. C. Wigham
Microphone..C. E. Egner and J. G. Holmstrom
Milk-vat....A. F. Stoelting
Mines, Check-holder for....L. F. Weaver
Mining coal....D. P. Loomis
Mirror attachment for windows....M. Nelson
Miter-box saw-support....E. A. Schade
Mixing mechanism....S. E. Ray
Mixing-machine....C. Steidle
Molder's chaplet....R. B. Haskins
Molds, Flask for forming gated....C. W. Blue
Mortise-lock....A. Tanner
Motor control....E. F. W. Alexanderson
Motor-governor....H. E. Warren
Mower....A. Kolehmainen
Music and like cover....J. N. Dean
Music-sheet-perforating apparatus....J. C. Bunge

Musical apparatus, Mechanical.....G. P. Brand
Nail and board puller.....A. Anderson
Nose-guard.....L. F. Adt
Nozzle, Adjustable.....W. T. Dodge
Nozzle, Water-....A. Allbright and G.G. Scudder
Nut-lock.....A. R. Cooper
Oil-burner.....G. R. Wyatt
Oil-burner, Welding.....B. W. Cribb
Oiling device.....J. W. Maddox
Onion-sets, Machine for topping and cleaning... J. R. Dimick
Ore-crusher, Eccentric.....S. Abernathy
Ore-reducing furnace.....G. Gronda
Package-fastener.....A. E. Boulton
Packing-case, C. M. Chapman and J.E.Woodbridge
Packing, Rod steam-.....O. D. H. Bentley
Pail, Dinner-.....H. W. Ryding
Paint.....J. A. West
Panel-board, Metering.....A. C. McWilliams
Panel for wooden structures.....O. C. Fenlason
Paper and the like, Process and machine for marbleizing.....H. Metzger
Paper bottles, Die for making closures for..... C. F. Jenkins
Paper bottles, Treating.....C. F. Jenkins
Paper container.....H. S. Brewington
Paper-drying machine.....F. L. Allen
Paper, Recovering waste.....S. Finkelstein
Paring-knife.....J. Kling
Pedal mechanism.....G. H. Davis
Pencil-sharpener.....E. C. Scruggs
Phonograph, 3 pat.....J. F. Ott
Phonograph.....P. Weber, *et al.*
Phonograph attachment.....J. Georigi
Phonograph-machine.....T. J. Blanch
Phonograph-records, Apparatus for making duplicate.....J. W. Aylsworth
Phonographs and other machines, Feed mechanism for.....T. A. Edison
Phonographs, Feed mechanism for.....J. F. Ott
Phonographs, Feeding mechanism for.J.F.Ott,*et al.*
Photography.....J. J. Johnson
Picker-stem.....H. S. Coburn
Picture machine, Moving-.....J. J. Pink
Pictures and like articles, Device for hanging..... G. P. Leonard
Pipe.....T. B. Bradford
Pipe-compensator.....J. Koenig
Pipe coupling, Automatic train-....R. G. Strother
Pistol, Self-loading.....R. Becker
Plane, Woodworker's.....J. H. Brown
Plant-protector.....G. Rozendal
Plow attachment.....J. E. Burton
Plow drag attachment.....J. E. Burton
Plow, Pulverizing-.....F Bedee
Pneumatic cleaning-tool.....C. B. Dalzell
Pneumatic-despatch apparatus.....F. R. Taiscy
Post-sharpener.....J. Conway
Power mechanism.J. M. Nachbaur and F.Stattman
Printed manifolding-form.....T. V. Maxedom
Printers' galleys, End-lock or stop-bar for..... W. W. Greenwood
Printing machines, Scrimp-rail for claico-..... H. Hadwin
Printing-machines, Sheet-inverting apparatus especially applicable for use in connection with..... T. M. North
Printing-machines, Side-lay apparatus for..... T. R. G. Parker
Printing on felt and the like....R. J. C. Mitchell
Printing-press.....A. F. Harris
Printing-press feed mechanism.....A. J. Ford
Printing-presses and the like, Device for locking types on type-carrying members of..J. R. Haydon
Propelling mechanism.....J. R. Fiala
Protractor.....F. Probst
Pump.....A. Baird, Sr.
Pump, Computing-..... ...S. G. Wise, J. E. Troyer, Jr., and J.E. Smisor
Pump-rod-pulling device.....J. C. Martin
Pump-valve.....W. G. Black
Pumps, Device for cleansing cylinders and pistons of dust-aspirating.....M. Falk
Push-button switch.....F. E. Seeley
Push or buck rake....W. E. and F. E. Van Horn
Rail-fastening for securing the rail-chairs to ties.. H. J. Gerhardt and F. C. Stecker
Rail-joint.....J. F. Beatty
Rail-splice.....D. Caryl
Railway-crossing.....F. E. Jacob
Railway device.....A. Martin
Railway electric signal.....A. C. Carey
Railway-rail tie, Composite.....J. G. Hill
Railway, Suspended.....R. Petersen
Railway-switch.....T. Jackson, *et al.*
Railway-tie.....W. C. McWethy, *et al.*
Railway-tie and rail-fastener..... J. W. Sheatzley and W. F. Hoefs
Ram, Hydraulic.....F. Hesse
Razor, Safety-.S. Hauser and E. Shepherd, *et al.*
Razor-stropping device.....J. Heissenberger
Recording mechanism.....J. M. Johnson
Register stand and cabinet, Revolving..... J. F. Woolsey
Rein and hitching-strap holder....W. L. Kunkel
Releasing device, Automatic.....F. M. Wells
Resawing-machine, Horizontal band..... F. T. McDonough
Rocking-horse, Traveling.....C. L. Corcoran
Roofing-strip.....C. Lagergren
Rope-computing machine.....C. A. Benbow
Rosin-applicator.....J. Ibbotson
Rotary engine.....J. Clark
Ruling-machine gage, Paper-.....C. O. Wheatley
Sacker.....J. P. McTimmonds
Safety appliance.....M. Matzner
Saw-filing machine.....E. D. Keeter
Saw-handle.....J. I. Pauley
Saw machine, Hack-.....H. D. Lanfair
Saws, Tail-guide for band-.....F. T. McDonough
Scales, Torsion-balance for.....A. Hitt
Screw-threads, Method of and means for forming.. L. Markel
Seal, Car-.....W. B. Eichholtz, *et al.*
Seed-delinting machine, Cotton-....W. E. Worth
Seeder.....H. Bessen
Sewing-machine.....H. F. Keegan, *et al.*
Sewing-machine attachment.....C. H. Kleuser
Sewing-machine attachment, Shoe-.M. H. Sullivan
Shaft-coupling, Antirattler.....J. B. Forster
Sheathing, Metallic.....L. J. Berg
Sheave or pulley.....J. E. Bordenkircher
Sheet-metal-bending machine.....H. C. Grant
Shifter.....J. K. Voorhees and V. V. Speer
Shingling-gage.....J. I. O'Brien
Ship construction.....T. M. Rees
Shirt.....J. J. Rabinovitch
Shoe-fastener.....J. Schacht
Shoe shank and ventilator, Combined....J. Ball
Shoe-stretcher.....J. D. Jannell
Shoe-turning machine.....B. F. Mayo
Shooting-glasses for marksmen....F. A. Guilford
Show-case, Fly and dust proof.....W. R. Kirk
Sign.....L. L. Walrath
Sign-boards, Means for securing glass beads on single perforated.....R. F. Venner
Sign, Electric.....T. E. Murray
Sign, Illuminated.....J. F. Druar, *et a*
Signal system, Automatic.....J. S. Payne
Single-phase motor.....E. F. W. Alexanderson
Skate, Roller-.....W. Schoenberg
Slicing machine, Bread-.....J. G. Pierce
Slub detecting and removing mechanism..... W. E. Morton
Smoke-preventing apparatus.....R. H. Burns
Smoker's pipe.....T. J. Stockton
Soap-granulator.....R. L. Edwards, Jr
Solenoid-switch.....A. W. Berresford
Sorting-machine.....C. Harzer
Sound-signals in water, Device for producing..... H. B. Gale
Spark-plug, High-tension.....J. and W. Sharp
Spring construction, 3 pat.....W. R. Smith
Spring construction.....G. C. Shoemaker, *et al.*
Spring-wheel.....H. J. Herbert and D. Ward
Steam-separator.....F. L. Allen
Steam-trap.....E. Gofferje
Steel plant.....J. C. Cromwell and H. W. Lash
Stock, Cushioned.....B. F. Schmidt
Store-service apparatus.....G. Staib
Stove, Dismountable petroleum or the like..... A. F. Chiesanova
Stovepipe device.....T. J. Holden
Street-sweeper..... E. W. Liberty and W. J. McElroy, *et al.*
Street-sweeping machine.....J. Santin
Sugar, Making.....C. P. Stewart
Switch-lock, Safety...A. Haddock and A. Schmitt
Switch-operating mechanism.C. E. Fryburg, *et al.*
Syringe, Hypodermic.....J. B. Woodruff
Talking-machine sectional horn..E. A. Hawthorne
Telegraph system.....W. Leivesley
Telegraph system, Wireless...V. C. De Ybarrondo
Telegraphy, Receiver for space...W. Schloemilch
Telephone attachment.....N. B. Parsons
Telephone-ringer.....N. P. Jensen
Telephone-stand.....E. A. Metcalf
Telephone-transmitter.....C. D. Babcock
Thermometer.....C. P. Steinmetz
Tire-case.....P. Evans
Tire contour-recorder, Wheel-..... W. C. Arp and F. F. Hildreth
Tire for vehicles, Metallic elastic.....G. Magaldi
Tires to rims of wheels, Means to connect..... E. B. Merigoux
Tires, Valve for pneumatic.....F. T. Clayton
Tobacco-pipe.....R. Wojan
Tongue, Wagon-.....E. Gunderson
Tool, Combination-.....W. J. Tweedale
Tool-holder.....H. W. Haskel
Toy.....E. J. Seward
Toy, Optical.....A. Deperdussin
Track-cleaner.....H. Quertier
Track-joint.....H. A. Myers
Track-sander.....F. W. Cole
Track-tamping implement.....A. F. Hart
Train-order-delivering apparatus...W. W. Allen
Transmission mechanism.....J. W. R. Andrews
Trap.....F. H. Hamblin
Tray attachment.....G. R. Ernest
Triturating and reducing mill.....C. J. Best
Trolley-guard.....S. Stroup
Trolley-wheel.....A. M. Levering
Trolley wheel and harp.....F. L. Eager
Trolley-wire support.....R. O. Couch
Trousers-hanger.....F. H. Deknatel
Trowel, Plastering-.....K. M. Sandvig
Truck, Car-.....J. C. Barber
Truck, Vehicle-.....N. E. Wilcox
Truss.....W. W. Clindinin
Tube-cutter.....O. R. Young
Tubes, Formation of stacks of....O. Zimmermann
Turbine.....O. D. H. Bentley
Turbines, Means for heating thick flanges of..... C. A. Parsons
Turnbuckles, Making, 2 pat.....E. E. Johnson
Turn-table.....J. Kitson
Twyer-block.....A. Benner
Twist-drills, Machine for making.....F. Laplant
Type-bar and hanger, Combined...T. M. Byrnes
Type setting and justifying machinc..... B. M. Des Jardins
Type-writer line-spacing mechanism..G. A. Smith
Type-writer ribbons, Device for automatically reversing the travel of.....O. Rutishauser
Type-writer type-bar construction..... C. W. Howell, Jr.
Type-writing machine.....A. T. Brown, *et al.*
Type-writing-machine ribbon mechanism..S.B.Post
Umbrella, folding.....W. Bowman
Umbrella-sticks, Machine for securing notches to.. J. B. Riehl
Urinal.....O. C. G. Brettell and J. F. Bailey
Valve.....R. T. Foley, *et al.*
Valve, Electrically-operated.....W. W. Annable
Valve, Gas-engine.....H. L. Jessen
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Railway-crossing, Noiseless J. E. Reyburn
Railway-crossing signal G. A. Silver
Railway semaphore-signal, Dwarf H. M. Abernethy
Railway signal system, Wireless E. R. Bredton
Railway-switch-operating mechanism C. W. Squires
Railway system, Motor-cycle-, 2 pat J. N. Vandegrift
Railway-tie and rail-fastener J. P. Donovan
Railway-tie, Metal H. J. Buell
Railway-tracks, Apparatus for depositing sand on W. D. Ross
Railway-vehicles, Means for controlling the movement of J. H. Just
Ranges and stoves, Towel-rack for F. R. Henry
Ratchet-wrench J. Knowles
Razor, Safety- E. H. McIntire
Reclining-chair C. A. Warner
Reel for coiling flats or other rolled sections F. H. Daniels
Regenerative furnace J. B. McKennan
Reversing mechanism F. J. Pall
Rifle-sight J. D. Pedersen
Ripping device G. E. Post
Rivets, Hand-tool for extracting H. N. Summers and C. M. Cooper
Rock-breaker C. C. Lane
Roof-flange, Adjustable H. C. Folger
Rotary engine J. R. Kinney, *et al.*
Rotary motor or pump J. R. Kinney
Rubber, Reclaiming devulcanized E. E. A. G. Meyer
Rubbing-post S. B. Wasson
Rule and linotype-slug holder, Election-square B. D. Deyo
Runner, Detachable S. Hand
Sand, Apparatus for cleaning and separation of E. M. Nichols
Sash-lock E. D. Farmer and H. B. Church
Saw, Band- A. Anderson
Saw-handle W. W. Taylor
Saw handle, Crosscut- J. Kallehner
Sawmill, Band- H. G. Dittbenner
Sawmill set-works and dog, Automatic power N. E. Rice
Saw-setting tool L. G. McKam
Scale, Computing- A. De Vilbiss, Jr.
Scraper, Forked or tined G. F. Koenig
Screen N. Brandt
Screw, Set- C. G. Lundholm
Sealing device, Packing-case- C. C. Batchelor
Sealing vessels J. A. Hicks
Seed-drill A. M. Campbell and I. Howard
Selective ringing-key C. A. Simpson
Service-box H. C. Hubbell
Sewage and the like, Apparatus for the bacteriological treatment of G. A. Lucas
Sewing-machine, Multiple-needle P. Diehl and M. Hemleb
Shade-adjuster T. X. Jones
Sewing-machine needles, Presser-foot attachment for J. H. Titt
Shade bracket, Window- A. M. Hazard
Shade-holder J. H. Dare
Shaft-bearing R. K. Amos
Sharpener, Razor-blade D. M. Perine
Sheet-metal handle E. Ohnstrand
Sheet-metal packages, Apparatus for forming A. R. McArthur
Sheet-supporting device F. K. Fernald
Ship-cleaning device W. Martin
Ships' plates, Making composite G. C. Berg
Shoe-dauber J. L. Wear
Shoe-upper-fastening device T. F. Whelan
Shooting-glasses C. E. Cook
Show-case frame A. A. Havenhill
Shutter-lower O. Frank
Sight-locating device J. P. Saxe
Signal and tail light P. C. Woodnutt
Signal mechanism W. W. Van Horn
Sink-stop O. J. Deegan
Slags, Deoxidizing O. Thallner
Small-arm, Automatic W. J. Whiting
Smelter-furnace J. P. Welch
Smelting furnace, Ore- W. Kemp
Smelting ore J. P. Welch
Socket-piece for studding, &c W. P. Rice
Soldering-tool L. Schemnitz
Solenoid-switch, Rocking A. T. Marshall
Sound-reproducing machines, Automatic needle-disengaging and stop mechanism for G. A. Oppenheimer
Sound-reproducing machines, Record for E. M. Perliner
Spark-plug J. C. Anderson
Speed-changing mechanism F. C. Brunhouse, *et al.*
Speed driving mechanism, Variable- P. T. Kenny
Speed mechanism, Variable- R. E. Rosewarne
Spindle, Compound F. Seymour
Spool W. E. Evans
Spool, Compensating- F. E. Cole
Spring E. H. Wood
Spring-link A. B. Day
Square, Bevel- D. E. Brandt
Stacker, Hay- L. J. Lindsay
Stamp-affixing machine, 2 pat E. H. Hotchkiss and C. Peach
Stapling-machine E. T. Greenfield
Steam-trap W. Wanstall
Steamer, Egg- B. Wells
Steel castings, Manufacture of J. K. Griffith
Sterilization vessel G. Van Eyck
Stitching machine, Book- J. F. Kugler
Stock and die J. E. Dundore
Stone-sawing machine M. Wallner and M. Owens
Stove, Portable W. B. Seeley
Stovepipe-cutter C. H. Hanshue
Strainer G. F. Grimm
Strap-seal S. Paruch and M. Dessauer
Sweeper, Vacuum- F. J. Matchette and C. Menkos
Swing G. W. Schilling
Switch C. Carson
Switch-points, Mechanism for rolling W. D. Eynon
Switch-stand B. R. Scott
Switching device O. Rennert
Tag and buckle, Combined R. G. Hitt
Talking-machine R. L. Gibson
Tape-scoring apparatus C. Thibodeau
Tapping means, Liquor- J. F. Terry
Target-practice apparatus, 2 pat H. H. Cummings
Taximeter C. H. Pearson
Telegraph, Printing-, 2 pat J. C. Parclay
Telegraphone H. R. Stuart
Telephone H. Eccles
Telephone system F. C. Unger
Telephone trunking system C. A. Simpson
Telescope, Terrestrial G. A. H. Kellner
Thimble, Sewing- C. E. Iles
Thread-finishing machine, Silk- E. Fohl
Ticket and holder for same, Continuous railway- J. A. Proctor and M. H. Elkin
Ticket, Railway or other A. Moyon
Tie-plates, Making rolled-metal W. L. De Remer
Tile-making machine W. J. McCracken
Time-recorder J. Alsenz
Tire W. B. Connell, *et al*
Tire-setting machine D. R. Evans
Toaster, Electric W. S. Andrews
Toilet-closet R. A. Bicoks
Tongs A. Bing
Tongs, Lifting- J. Parrett
Tongs, Pipe- E. M. Hedlund
Tool, Finishing- J. J. Parth
Tool, Pressure-driven reciprocating A. Palmros
Tooth, Artificial F. Rose, *et al.*
Toy, Automatic C. W. Cheney
Toy cannon C. L. Wood
Track-laying apparatus R. C. Spandau
Train-controlling mechanism O. Gibson
Train manipulating, System and device for indicating L. B. Stillwell
Trains, Resetting mechanism for recording- O. White
Transfer-press W. L. Sloane and J. S. Cwsley
Transportation system C. Worthington
Transportation, System of river J. S. Lane and J. L. Mathews
Trap J. Fozseryi
Trap-door lift A. G. Peggess
Trolley G. G. Miller
Trolley-clip J. C. Michaelsen
Trousers-supporter S. Levin
Truck J. H. Smith
Truck-frame A. L. Hastings
Tube-cleaning apparatus J. G. Frerichs
Tube filling and tamping machine T. A. Edison
Tunnel attachment, 2 pat J. A. Horne
Turbine for driving boiler-tube cleaners H. F. Weinland and H. G. and G. H. Ainge
Turbine, Steam- R. A. McKee
Turn-table J. R. Peattie
Twisting-machine T. Nunn
Type setting and distributing machine A. G. Halfpenny
Type-writer cabinet J. D. Cleaton
Type-writer printing mechanism R. W. Uhlig
Type-writer ribbon-feeding mechanism R. W. Uhlig
Type-writing machine J. Felbel
Valve, Air-control steam- J. A. Hecks
Valve, Gate- E. D. Jefferson
Valve, Steam-engine J. C. Glenn
Vehicle-seat J. Pensen
Vehicle-top, Collapsible C. J. Tucker
Vehicle-top door F. E. Heylmann
Vehicle-wheel V. E. Van Cantfort, *et al.*
Vehicles uphill, Device for assisting S. H. Stevens
Vending machine, Liquid- A. H. Sage and F. E. Mitchell

Vending-machine....M. H. Johnston
Violin....J. E. L. Winecoff
Violin-tailpiece....N. C. Hale
Wagon, Dumping-....W. S. Livengood
Wagon-seat riser....R. N. Collins
Wall-bracket....W. C. Morrill
Wall of plastic material, such as concrete, &c., Retaining or quay....G. P. Wood
Wall-plug....H. I. Jeffers
War-machine....J. Bouscal
Wardrobe for bedsteads....H. B. Williams
Washboiler....I. Mozley
Washer-gasket....H. Mueller
Washing-machine....H. S. Judd, *et al.*
Watchmakers' lathes, Tool-rest for....F. W. Derbyshire
Water, Attachment for regulating and indicating the temperature of running....C. E. and W. H. Krueger
Water-closet....H. W. Ward, *et al.*
Water-closet coupling....H. S. Maddock
Water-closet, Ventilated....J. K. Pennington
Water-purifier, Electric....M. R. Frei
Water-tube boiler....R. Hutchison
Wedge-blocks and doyle-pins, Apparatus for cutting....S. Smith
Weigher, Automatic grain-....A. G. Yerk
Weighing apparatus, Automatic..W. E. Nickerson
Weighing-machine....W. W. Rosenfield
Weighing-machine, Automatic....C. A. Douglass, F. L. Jones, and A. F. Harris
Weighing-machine for liquids, Hydraulic..A. Rak
Well-cleaning-out device....T. B. Hyland
Wheel....F. E. Felts, *et al.*
Wheel-chock....G. N. Crawford
Wheelbarrow....L. Wigh
Wickerwork....E. M. Calef
Wind-screen....G. H. Beaton
Windmill mechanism....I. C. Rust
Window-screen....A. B. Hill
Window-tent....J. G. Allen
Wire basket....J. B. Porter and E. B. Jenkins
Wire-crimping machine, Meshed-....A. Shuman
Wire-fabric-making device....F. H. Hamblin
Wire-hanger....F. L. Sessions
Wire-netting stretcher....H. J. Byrnes
Wire-stretcher....E. A. and C. W. Wheeler
Wood, Preserving....J. M. Nelson, Jr.
Woolen....E. Leurent

DESIGNS.

Grill....J. J. and S. P. Burgess
Light-fixture....M. Schneider
Monument, Burial-....A. L. Just
Plate or similar article....C. A. May
Shades and the like, Fabric for window-....A. A. Bolck
Stove....B. Will
Textile fabric....J. Korzinek

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MECHANICAL PATENTS.

Abdominal supporter....E. F. Small
Acid compound of alpha-isatin-anilid, Making sulfurous-....C. Stephan and A. Rahtjen
Addressing-machine....T. E. Plater
Adjusting mechanism....A. H. Wouters
Advertising device, Coin-controlled....J. H. Montgomery
Aerator....L. E. Leach
Aerial navigation....J. S. Letts
Aeroplane....D. S. Foster
Aeroplane, Motor-driven....A. E. Mueller
Agricultural implement....M. Szarka
Air-brake system....G. Macloskie
Air-ship....B. F. Seymour
Alloy, 2 pat....E. B. Craft and J. W. Harris
Annunciator and advertiser, Street and station....G. R. Livergood and B. C. Donnelly
Apparel-cutting apparatus....M. E. Kellogg
Apron or robe-holder, Storm-....C. S. Beebe
Area-finding apparatus....A. C. Freeman, Jr.
Armor-tired wheel....C. E. Dulin
Auditorium-seat....B. Wilson
Automobile....H. K. Holsman
Automobile-brake....C. Todd
Automobile braking mechanism..H. K. Holsman
Automobile circular receptacle....G. V. Hagerty
Automobile-coupling....A. Koage
Automobile-seat, Detachable....J. R. Graves and J. Benson
Awning cords or straps, Locking device for. S. Asch
Axle, Vehicle-....D. N. Marler, *et al.*
Back-band and hook, Adjustable iron....G. W. Moores
Bait-casting reel....W. T. Bronson
Baking-pan....J. F. Costa
Baling-press....J. Haag
Banana-shipping case....G. W. Hoffman
Barbers' chairs, Head-rest for....R. S. Wallace
Barber's comb....E. J. Sheffield
Barrow, Hand-....W. F. F. Nehls
Basins, tubs and the like, Waste and overflow for....C. F. Longfellow
Bath-tub attachment....E. M. Shipp
Bean-picking machine....G. F. Crippen
Bearing, Ball-....O. H. Karcher
Bearing for cars, Center-....J. C. Barber
Bed, Arm-chair..J. Lindqvist and E. I. Hillstrom
Beet pulling and topping machine....P. M. Gilbert
Bell, Electric....E. A. Graham
Belts, Machine and process for treating fabric....F. Stone
Bicycle spring-fork....E. Lampel
Binder, Loose-leaf....G. Spence
Bindings to sheets of material, Machine for applying....F. C. Lothrop
Block core, Hollow-....M. Outeda
Block-signal system, 4 pat....L. A. Hawkins
Blowpipe for calcining incandescent filaments....G. Auger
Bobbin-holder....T. F. Roney
Boiler....H. R. Bailey and J. E. McFarren
Boiler furnace, Steam-....H. and G. S. Gallagher
Bolster....J. H. Baker
Bolt construction...C. M. Reeves and E. Fuller
Bolt-retainer....H. Bauer
Bones of the leg, Apparatus for setting the fractured....W. Amos
Boot and shoe....R. J. Sawyer
Boot or shoe upper....A. E. Whitelaw
Bottle, Non-refillable....C. W. Schmidt and A. Mackie, Jr.
Bottle soaking and rinsing machine. J. H. Kintzele
Bottle structure....A. F. Callahan
Bottles, Screw-capping....A. Wilzin
Brake-hanger....S. M. Curwen
Bread-cutter....G. Kawasaki
Brick-speckling machine....J. D. Martin
Brine-cooler....B. Walter
Brush....G. H. Pennington and W. Witherow
Brush, Rotary....T. W. Johnson
Bucket, Clam-shell....C. C. Williams
Building-block mold....M. Outeda
Burnishing-machine....C. Kozisek
Buttons, &c., to fabric, Machine for attaching....A. R. Havener
Cabinet, Assorting-....F. F. Todd
Cabinet for holding milk-bottles, &c....H. H. Choate
Cabinet, Meal-....W. T. Grafton
Cake-turner....C. H. Hacker
Calculating-machine....H. Kuentzler
Calender, Cloth-....G. J. Potman
Call-signal, Grocer's or other merchant's....A. L. Philbrick
Camera-finder....J. A. Robertson
Can-testing apparatus....W. H. Norhaus
Candy-coating machine....G. B. M. Goodwin
Candy spinning and twisting machine, Stick-....D. T. Igou
Canopy....R. K. Hook
Car-brake....G. M. Hoadley
Car-brake-connector support, Railway-....G. E. Kelly and G. F. Royer
Car brake, Railway-....G. M. Hoadley
Car door, Grain-....J. F. McGlenn
Car, Dump, 4 pat....A. Campbell
Car-heater....J. M. Coleman
Car-platform knee....H. E. Haddock
Car, Railway-....J. W. Slaven
Car-replacer....M. L. Stombaugh
Car step, Auxiliary passenger-....G. B. Milliken and A. B. Weaver
Carboy-package....R. H. Gillean
Carburetor....F. H. Knight
Card-case....J. C. A. Fitch, Jr.
Card-clothing, Apparatus for making....A. F. Estabrook and G. O. Currier
Cart, Lumber-....G. Streich
Carton or box....G. A. Pfeiffer
Cartridge base-wads, liners, and tubes, Machine for assembling....H. D. Hodge
Cartridge Making Machine....H. D. Hodge
Cartridge-shell....L. A. Sherman
Cash-register attachment....J. E. Cosby
Casket-carrier....L. H. Montross
Casting apparatus....I. Shonberg
Casting pipe....D. B. Dimick
Casting ingots, and the like, Making..F. E. Mesta
Ceiling-fixture, Electric....A. G. Walin
Cement-block machine....J. E. Moore and G. F. Simmons
Cement-post machine....B. J. Gibler
Chain....F. W. Wakefield
Chair and ironing-board, Combination. J.L. Hufft
Chair attachment, Barber's-....B. S. Mead
Chandelier-stem....G. M. Beardslee
Charging apparatus. P.H.Douglas and I.D.Thomas
Check, Manifolding sales-....F. Thomas
Child's seat....L. Scott
Churn and butter-worker, Combined. D.A.Sprague
Cigar-cutter and match-vending machine, Combined....J. Pignocco
Cigar wrapper cutter and rolling board....S. Hartman
Circuit-breaker, Automatic....N. H. Holland
Circuit-controlling device....E. Johnson
Clipper, Pneumatic....C. Shurtleff
Clock....E. E. Gage
Closet-seat....A. J. Bogart
Cloth-handling machine....C. Weiss
Clutch-device safety appliance....K. J. Smith
Clutch mechanism....V. Szucs
Clutch, Wire-....C. Schroder
Coat-hanger....G. G. Gershon
Cock or valve, Stop and waste....J. H. Glauber
Cock to prevent bursting by frost, Self-closing water-....G. Muller
Cockeye....O. Simle
Coil-forming machine....W. D. Pomeroy
Coin-controlled mechanism....H. R. Strouder
Coin-sorter....T. F. Galligan
Collar-pad holder....G. P. Mathers
Comb-barrette....A. Burke
Concrete forms, Apparatus and process for molding....H. A. Loser
Concrete-mixer, Portable....C. W. Overturf
Concrete structures, Producing..C. W. Chappelow
Cooling-towers and the like, Distributer for....J. F. Grace
Core-agitator....R. R. Stewart
Corn-popper....D. H. Higgins
Corn-sheller....E. E. West
Cotton-chopper....N. Mabry
Cotton-presses, Safety-dog trip for...J. C. Wright
Counting and receptacle-filling machine....E. E. Kallenbach
Crate, Collapsible....T. G. Collas
Crate reinforcing means, Shipping-...C. W. Smith
Cultivator....H. Stripe
Cultivator attachment....D. B. Browning
Cultivator, Cotton-....W. W. and H. L. Ross
Cultivator replanting attachment....F. M. Horn
Current-controller....F. Andrew
Current-controlling means, Alternating-....D. L. Lindquist
Curtain-pole fixture....W. S. Moffat
Cuspidor....M. D. Green, *et al.*
Cutter....D. D. Frothingham
Cutting, scoring, and creasing device-..J. V. Reed
Damper-controlling mechanism, Clock controlled....R. P. Daubenspeck
Dashboard-safe for automobiles and other vehicles....D. Barnard
Dental apparatus, Rotary....M. Wentworth and W. J. Garbutt
Derrick-bracing means....F. E. Foster
Desk and chair, Combined school....H. J. Siems
Die-press....G. B. Myers
Directory-board....C. A. Johnson
Dish-washer....L. H. Desjardins
Display-cabinet, Rotary....D. Duncan
Display-rack, Rotatable....H. Krasne
Display-stand....M. Friedman, *et al.*
Distilling mercury from gold amalgam, Apparatus for....W. E. Bennett
Door-check....A. Rosenberg
Door construction....W. L. Evans, Jr.
Door-fastener....L. Ray.
Door-operating mechanism, Dump-, 2 pat....F. Seaberg
Door-screen....J. Fink
Draft appliance....W. F. Gaines
Draw-bars and yokes, Fastening device for....F. W. Wood and J. T. New
Draft-equalizer....W. H. Schultz, *et al.*
Drier....R. K. Meade
Drying and grating apparatus....E. D. Hough and E. E. Wilson
Drinking-fountain, Automatic....L. Baumgartner
Driving connection, Resilient..G. M. Eaton, *et al.*
Dye, Azo....E. Ulrichs
Dye-jigger....F. Shaw
Dynamo-inductor....G. A. Coleman
Ebonite and vulcanite, Manufacture of....O. C. Immisch
Edge-setting machine....W. Gordon
Electric battery....M. Nicolas
Electric contact, Overhead....T. W. Small
Electric-machine cooling means, Dynamo-....W. L. R. Emmet
Electric machine, Dynamo-....J. E. Noggerath
Electric time-switch....A. Weinberg
Electrode battery....G. A. Wedekind and H. P. R. L. Poerscke
Elevator-door-operating mechanism..F. K. Fassett
Engines, Fuel-injection nozzle for oil-..H. Soeldner
Engines, Means for starting internal-combustion....W. B. West
Envelop....W. A. Lueneburg, *et al.*
Evaporator....T. Suzuki
Excavating and tranching machine..T. D. Gleeson
Excavating-machine....W. F. and C. C. Jacobs
Extension-bolt....F. H. Crump
Extension-table....S. W. Whonn
Extension-wrench for operating tube-expanders, &c....F. M. Hawkins
Fabric folding and piling mechanism....J. A. Butler and L. Flick
Fabric, Method and apparatus for handling coated reinforcing....A. Thoma
Fare-register....J. F. Ohmer
Farm-gate....J. W. Lyon
Faucet....E. M. and M. Deiller, *et al.*
Faucet, Water-....W. B. M. Bashlin
Feed-mixing machine....T. C. Manning
Fence-clamp....B. F. Nummy
Fence-post, Cement....J. F. McElroy
Fence, Wire....R. B. Hunt
Fence-wire holder....J. H. Lawton
Fertilizer-distributer....C. C. Atkinson
Fifth-wheel....W. True
File or holder for sales-slips....E. H. Huber
File or the like, Bill-....F. J. Kristofek
Fire-escape....P. Rieseck, *et al.*
Fire-escape, Drop-stair....A. C. Mowrey
Fire-extinguishing apparatus....H. V. R. Read and R. H. Campbell
Fish, &c., Apparatus for treating....A. C. Pearson
Flange finder, Broken-....J. Jenkins
Flow-regulating device....N. S. Twiford
Fluid-pressure brake. W. V. Turner and J.S. Custer
Fluid-pressure brake, Electric....W. V. Turner and R. H. Blackall
Fluid-pressure motor....J. E. Osmer
Fluid-pressure regulator....E. Schulte
Focusing device, 2 pat....R. Kroedel
Foldable table or stool....L. Smiejkowski
Folding chair....W. O. Canouts
Forge....J. Philipski
Foundation construction....E. Coignet
Furnace auxiliary heating device....E. T. Marsh
Furnace-grate....W. J. Thomas
Fuse-mounting for electric cut-outs..W. J. Patnode
Garbage-burner and water-heater, Combined....J. J. Dube
Garden-tool....H. M. Morrill
Garment-hanger....G. A. Willar, Jr.
Garment-hanger support....F. Wolf
Gas-generator....L. Van Vliet
Gas generators, Carbid-feed device for acetylene-....J. W. Weaver
Gas-pressure, Apparatus for increasing..F. A. Ray
Gas-producer....F. Muller
Gas-producer revolving gate....H. Rehmann
Gas-tanks and distributing connections therefor....F. W. Beardsley
Gate....D. A. Ingersoll
Gear....D. F. Sparr
Gear, Marine reversing-....J. Petrelli
Glass-molding machine....W. J. Miller
Governor, Explosive-engine....H. E. Woolery
Grain-door....G. R. Dunn
Graphophone speed-changing mechanism....F. F. Murdock
Grapple, Hand-....W. Autenrieth
Grate attachment..J. M. White and W. C. Sanders
Grate, Self-dumping....W. C. Mizell
Grinding-machine....J. Miller, Jr.
Gun-cleaning implement....J. S. Upham
Gun-sight....J. A. Kennedy
Gun, Spring-....R. N. and H. C. Laudermilch
Gutter-corner, One-piece sheet-metal....A. Friedley and H. F. Voshardt
Hammock, Couch-....W. J. McBride
Harrow....E. Haiman, *et al.*
Harrow-tooth, Revolving....D. J. Hoover
Harvester and like draft adjustment..A. R. Blewett
Harvester attachment....M. Molitor
Hat-fastener....G. Gerstheimer
Hat-frame machine....C. Feinstein
Hay-rake....J. H. Kobelanz
Hay rake and loader....G. E. Cadwell and N. E. Studebaker
Headache appliance. C. Gray and O. B. Hitchcock
Heating, Electrical....W. M. Johnson
Heating system....A. G. Paul
Heel....W. C. Kempton
Heel-burnishing tool....C. G. Belmar
Heel for shoes, Cushion-....J. G. Daubert
Hinge, Flask-....P. S. Poindexter
Hinge, Gravitating....W. E. Rape
Hinge, Spring-....A. Danielson
Horseshoe....A. D. Cartwright
Horseshoe-calks, Forming....C. and E. Ludvigsen
Horseshoe-calks, Machine for forming....A. T. McCreary
Hose-coupling....A. J. Dolder, *et al.*
Hot-water heater....G. R. Gallagher
Husking-rollers....H. E. Purdy
Hydraulic motor....H. C. Shaefer
Ignition apparatus....G. Haniquet
Illuminating-body....O. Mannesmann
Incandescent-body-fastening device....E. Steil
Incandescent burner, Inverted....W. and H. Anderson
Indian club and dumb-bell, Combined. W. H. Burr
Indicator....A. Sundh
Inking mechanism....W. Spalckhaver
Insecticide....J. R. Martin
Instep-support or arch-prop, reissue....J. W. Arrowsmith
Insulating-linings, Means for attaching. C.D. Platt
Insulator....M.T.A.Rubierschky and P. E. Herkner, *et al.*
Insulator, Non-detachable....H. Bartlett and A. P. MacCallum
Insulator-pin....C. J. Darff
Insulators, Machine for producing glass. C.M.Zurn
Internal-combustion and air-compressing engine..W. Risley
Internal-combustion engine....D. Roberts and C. James, *et al.*
Invalid's table...F. A. Smith and D. L. O'Brien
Ironing-board....C. Paulsen
Jar, can, &c., adjustable measuring-cover. J.Seiffert
Jar-closure ring....G. H. Womelsdorf
Jar wrench, Fruit-....W. G. Niemann
Jewelry arranged for holding interchangeable gems or stones....C. H. Allen
Jointer's adjustable table....C. F. Haldeman
Journal-box....T. Hirtzler
Kiln....G. Pierboni
Kinematographic apparatus....W. Friese-Greene
Knife-wiping device..G. Wallin and D. F. Shryock
Knob, Door-....J. H. Shaw
Knobs, Forming carriage-curtain....F. Laible
Knockdown box....J. Kelley
Knotter....B. E. Byrd
Labeling-machine....F. O. Woodland
Lacing-hook....F. L. Reeder
Ladder, Fruit-picker's portable....E. A. Smith
Lamp....W. H. Thayer
Lamp, Alcohol-....S. Sternau, L. Strassburger, and J. P. Steppe
Lamp, Arc-....R. H. Pyle
Lamp-burner....A. H. Coombs
Lamp flexible cable....E. J. Guay
Lantern....M. C. Wells
Lantern, Signal-....H. G. Potts and C. Hauber
Lavatory-fixture....D. A. Carpenter
Lawn-edge trimmer....H. P. Dague
Lenses, Clip for connecting temples and nose-pieces to....J. W. Woodard
Letter-holder....J. W. Givens
Level....G. J. Bensen, *et al.*
Level, Plumb-....J. E. McMahal
Link, Resilient....G. M. Eaton
Link, Reverse-....M. A. Fountain
Linotype-magazine rack or support. H.W.J.Meyer
Liquids, Sprinkler or device for spraying and distributing....A. Bryan
Lock....J. C. Crosswell
Lock alarm attachment, Door-....E. E. Lundberg
Log-grab....H. M. Rounds
Loom....B. F. McGuinness, *et al*
Loom, Terry-....H. Bardsley.
Loom warp stop-motion....H. Wyman
Lubricant-holder....H. A. MacClyment
Lubricating apparatus....H. E. Jordan
Lumber-loader....W. C. Starr
Mail-catcher....B. A. Ballinger
Mangle....E. R. Seifert
Manifolding-pad....E. Carney and E. Stine
Mantle-shirring machine....S. Cohn
Marking-gage....G. M. Yates
Masticator....S. M. Kohonke
Match-box....A. J. Bechtel
Match-box and cigar-cutter, Combined....E. Oldenbusch
Measuring instrument....H. R. Harris
Measuring instrument having an electromagnetic brake....O. Schulze
Meat-hanger....E. L. Hite
Meat mangle or tenderer....C. McBratney
Mechanical movement....J. E. Noepel
Metal, Hardening and toughening..H. W. Partin
Metals dissolved in mercury, Oxidizing....J. Whiting and C. F. Burgess
Metals from their ores, Obtaining....A. T. Elliott and A. Miller
Metals, Removing tarnish from....M. H. Keyt
Metallic compounds, Reducing....F. J. Tone
Metallic surfaces, Finishing....A. Ridd
Micromoter-gage, Indicating....J. Wahlberg
Milk-registering machine....C. F. Snyder
Milling-machine....J. Edgar
Mine, Submarine....A. P. Broomell
Miter-box....T. M. Birkett
Mixing-machine....C. W. Clark
Mold-making machine....H. R. Atwater
Molding....T. J. Palmer
Motor-control apparatus....W. O. Lum
Mower, Lawn-....H. Deck
Muffler....J. M. Walton
Musical instrument, Pneumatic....E. de Kleist
Musical instrument, Stringed....N. Turturro
Nautical instrument....R. J. Hodge
Necktie-retainer....R. V. Townsend
Nut and bolt lock....L. P. Hansford
Nut, Lock-....S. Zuchtmann
Nut-lock....W. H. Faulkner
Oil-burner....J. F. Milton
Ordnance, Telescopic sight for....A. Konig
Ore separator and concentrator....H. L. Orr
Packages, Information and identificarion means for returnable....P. N. Faller
Packing for surface-condenser tubes....W. Quint
Pail, Milk-....A. Lawrence
Pan attachment, Cooking-....F. L. Benedict
Paper bottle and other container. H. S. Brewington
Paper-cutting machine....T. C. Dexter
Paper-hanger's tool....T. J. Olds
Pasteurizer....L. S. Pfouts
Pea-sheller....A. Aikele, Jr.
Pen and pencil holder....A. M. Moylen
Pen, Fountain-....A. B. Spangler
Pencil and making same....F. H. Lippincott
Pencil-sharpener....A. J. Rasanen
Phonograph, &c., attachment....G. F. Perrenot
Photographic apparatus....J. J. Kelly and J. F. Treerdell
Photographic-film roll....T. M. K. Overland
Photographic plate or film holder....F. Whitney
Photographic shutter....R. Kroedel
Piano-action....G. A. Wheeler
Picture machine, Moving-....B. A. Proctor
Pinion-cutting machine, Automatic....A. H. Neureuther
Pipe cap, Ground-....P. F. Williams
Pipe connection....T. D. Gleeson
Pipe-coupling....G. E. Kelly and G. F. Royer
Pipe-section mold, Drain-....S. L. Simons
Pipes, Device for removing obstacles from drain-..J. A. Mulherin
Planers, Side-head tool-holder for metal-....C. Meier and G. Langen
Planter....T. W. Burk
Planter and marker, Check-row....J. Raynor and C. Foster
Planter, Potato-....N. J. Charlson
Planter, Check-row corn-....T. F. Donham
Plate or pan lifter....S. A. Holman
Platform, Self-adjusting....J. F. Logan
Pocket-protector....P. A. Bendixen

Polishing compound....W. J. Ochs
Potato-digger....J. M. Herring, *et al.*
Poultry-fount....W. E. Smith
Powder-drier..A.F. Gebhardt and W. S.Hutchings
Power-press, Metal-working....F. K. Caswell
Precious metals, Recovering....J. H. Reid
Preservative, Structural....G. D. Coleman
Presser-foot....G. C. Crompton
Pressure-regulating apparatus....T. G. Mouat
Priming-cup and spark-plug, Combination....A. Peltier
Printing attachment for paper-roll holders....W. T. Geary
Printing-press....A. J. Hodge
Printing-press guide....E. O. Anderson
Printing-presses, Type-writing attachment for use on platen....C. C. Fraser and G. W. Lilley
Propeller, Boat-....H. Zenke
Puff-iron....J. W. Cook
Pulley, Split....H. D. Walker
Pulverizer....J. W. Block
Pulverizing-mills, Bearing for....M. Benjamin
Pump....R. F. Kreiter
Pump, Automatic oiling-....P. A. Tornwall and E. E. Darrow
Pump-governor....R. Conrader
Pump, Measuring-....H. J. Wichman
Pump-meter....C. L. Duenkel
Punching and spacing machine....M. M. Beasley
Puzzle....R. W. McMichael
Quilting-frame....J. Culler
Radiator....J. A. Miller
Radiator, Press-....F. E. Vorheis
Rail....P. Peterson
Rail-brace....S. M. Whitmore
Rail-fastener....J. A. McMillen
Rail-joint....W. P. and S. G. Thomson, *et al.*
Rail-joint and brace....A. J. Mahr
Rail-joint, Insulated....G. L. Hall
Rail-joint splice-bar, 3 pat..W. G.and S.G.Thomson
Rail tie and fastening, Composite..B. Wolhaupter
Railway accidents, Device for the prevention of..R. Hauser
Railway automatic safety appliance..R. D. Farrell
Railway collisions, Apparatus for preventing....T. C. Mason
Railway, Pleasure-....J. A. Miller
Railway-tie....J. M. Davidson, *et al.*
Railway-tie, Metallic....A. Frey
Railways, &c., Sound-destroying device for....J. B. Strauss
Range....H. J. Mathias
Reamer, Expansion-....L. C. Woerner
Recording instrument....R. P. Brown
Recording-lock....H. S. Hallwood
Refrigerator....W. T. Nicholls
Relay, Mercury-contact....C. F. A. Schuldt and F. H. Nicholson
Resilient connection....J. E. Webster
Reversing mechanism....J. Petrelli
Rock-drill....H. W. Burgess and J. Hepwort
Rock-drilling machine....J. E. H. Grose
Rocking-horse, Traveling....S. Spaine
Rolling apparatus, Car-wheel-....C. Mercader
Roof, Glass....F. Wessels, Jr.
Rosette....F. C. De Reamer
Rotary cutter....A. Victor
Rotary gas or oil engine, Reversible....A. Finch
Rotary reversible engine....W. Risley
Rough-rounding and channeling machine....E. Bayard
Roundabout driving mechanism....A. W. Jones
Ruler and blotter, Combined....J. W. Guillott
Ruler Parallel-....G. W. Young
Sad-iron, Hydrocarbon....F. A. Hoya
Safe, Walled....E. C. Kelonge
Sand-molding match-plate....J. Lewis, W. A. Tenhagen, and C. S. Reed
Sand-screen....J. S. Little and T. A. Jones
Sash-balance....E. Vanderstegen, *et al.*
Sash-cord fastener....B. Sheinberg
Sash-fastener....G. D. Wheelock
Sash-lock....H. G. Voight
Saw, Metal-cut-off....P. W. Post
Saw-set....C. S. Shaw and J. M. Spellman
Scales, Illuminating apparatus for....H. H. Bane and S. G. Crane
Scraper, Road-....C. D. Kinsman
Screen....F. J. Rembusch
Screen window or door....W. Flanagan and L. M. Mullinix
Screw-cap....F. H. Gross
Scrubbing-machine....H. F. Ackerman
Seal, Snap-....E. J. Brooks
Sealing receptacles, Fusible tablet for....W. M. Brownlee
Seam for sewed articles, 2 pat....W. Arbetter
Seam or hem....W. Arbetter
Sewing-machine attachment....C. Stafford
Sewing-machine, Blindstitch....W. Arbetter
Sewing-machine lubricating device...P. J. Black
Sewin -machine needle....W. F. Lewis
Sewing-machine thread-controlling means....J. Maitland.
Sewing-machine thread-waxing device....F. W. Merrick
Shade and curtain hanger....D. S. Masden
Sharpening means, Band-knife-...W. B. Keighley
Shirt....W. M. Wolfe
Shock-making machine....G. Marshall
Shoe, Turned....H. C. Rowe
Sickle-bar driving mechanism....M. F. Watkins
Sign construction....J. A. Wiedemann
Signaling device....W. P. Smith
Silicon carbid, Producing....F. J. Tone
Sizing-composition....M. Rossi
Skate-wheel....J. Nuttall
Skirt-gage, Dressmaker's....M. Stein
Small-arm....W. Venier
Snow-plow....A. Drowley and D. D. McLean
Snow-road-making machine....F. Alexander and B. A. Muncil
Soldering-iron, Self-heating....W. G. Landells and H. J. Huckson
Soldering machine, Can-....E. F. Hartlove
Sound-reproducing-machine record..R. M. Hunter
Speed-changing mechanism, 2 pat..G. D. Munsing
Speed-indicating and distance-recording mechanism....T. M. Foote
Spigot-guard....S. B. Davis and E. H. Rabiger
Spinning and doubling machinery...J. Robertson
Spinning and twisting machine....C. E. Lombard
Spinning-ring....N. Payment
Sprinkling-machine....E. Tomer
Square, Carpenter's....L. E. Bailey
Stamp, Dating-....H. E. Liddle
Static induction generator....B. E. Baker
Station-indicator....C. O. Frick
Stamping-machine....A. Van Brunt
Steam-generating system....C. Fero
Steam-trap....M. J. Boyle
Steel free from protoxids, Producing..O. Thallner
Step or running-board....W. Cairns
Storage battery....L. H. Flanders
Strainer....W. S. Elliott
Strainer for teapots....A. Newman
Sulfur trioxid, Apparatus for making....G. Eschellmann and A. Harmuth
Sulfur trioxid, Making....G. Eschellmann and A. Harmuth
Surgical splints, Material for....S. C. Sims
Switch....H. N. Motsinger
Switch-rod....E. W. Brown
Switch-shifting mechanism....L. Devers
Swivel connection....G. Guild
Syringe, Vaginal....C. S. Eichholtz, *et al.*
Table-slide....L. A. Wiedeman
Tanning skins and hides....H. Schmid
Target-holder....C. P. Worrell
Teeth, Composition for treating....R. Matweff
Telegraph and other poles, Protector for....R. B. Lamb
Telegraphy, Space, 2 pat....S. Cabot
Telephone-line, Four-party....K. Weman
Telephone repeating system....H. E. Shreeve
Telephone system....H. P. Clausen
Telescope or field-glass....S. Widmar
Telescoping elevator, Portable....S. B. Minnich
Telpherage system..O. J. Davy and C. W. Dauber
Terminal-connector construction....C. Cuno
Tetrabromindigo and making same....W. Bauer and A. Herre
Thermal Protector....S. B. Fowler
Thermic controller....E. H. Richardson
Tire, Vehicle-wheel....F. A. Seiberling
Tobacco-pipe....J. A. Irving
Tobacco-stemming machine....F. K. Heupel
Tobacco-stemming-machine stemming roller....F. K. Heupel
Tool-holder....L. T. Harkness
Torch and soldering-iron, Blow-....F. J. Mann
Torpedo, Automobile....H. Maxim
Torque-opposing device....G. M. Eaton, *et al.*
Toy....J. G. McConaghy
Toy push-wheel....J. Hanley
Track-sanding device....M. A. Brown
Tramways, Rope-grip for aerial wire-rope....J. H. Montgomery
Trap....S. M. Cole
Tray, Candy-....A. Strand
Tribromindigo and making same....W. Bauer and A. Herre
Trimming mechanism....J. H. Michener, Jr.
Tripod....H. A. Kircher
Trolley-guard....S. G. Wilcox
Trolley-wire coupling....J. W. Kline
Trousers-supporter....A. Marschner
Truck, Piano-....S. Bilger
Trunk or packing-box....T. W. Post
Tubular or hollow bodies, Manufacturing reinforced....L. H. Rentzsch
Turbine-driven apparatus....R. H. Rice
Turbine, Reversing....H. T. Werber
Type-writer....J. M. Harris
Type-writing machine....B. C. Stickney, *et al.*
Type-writing machine, 3 pat....A. T. Brown
Type-writing machine manifolding-platen....E. Z. Lewis
Umbrella....W. H. Edwards
Valve....F. M. Patterson
Valve and other mechanism, Automatic device for operating....F. W. Waterman
Valve apparatus, Alternating-current electromagnetic....F. W. Newell
Valve, Blow-off....G. V. Schmid
Valve, Check-....C. J. Drury
Valve for air-brakes, High-speed reducing-....W. V. Turner
Valve for steam, compressed air, or gas, Safety-..G. Grusendorf
Valve-gear....J. J. Redman
Valve mechanism, Relief-....J. Sturgess
Valve-operating means for closets, Flush-....L. Links and R. E. Irwin
Vehicle-cushion....J. E. Mossman
Vehicle-wheel....L. Turner, *et al.*
Vehicle-wheel grip-tread....F. Holan
Vehicles, Pole-hound attachment for....C. A. Hennecke
Vent, Safety-....M. H. Page
Ventilator....J. J. Maier
Violin-bow screw....W. R. Gratz
Voltage-regulation system....P. Rose
Wagon-cleat....W. H. Wheeler
Wagon-jack....F. J. Feldt
Wagon-unloading device....S. C. Leonard
Washer....M. D. Willard
Washing-machine....A. A. Zachary
Washing-machines, Operating mechanism for the dollies of....R. D. Tittle
Water-closet sanitry seat....J. W. McAuliffe
Water-closet-seat attachment....G. K. Hashim
Water-gage....F. M. Ashley
Water-gate....J. G. Gladding
Water-motor....W. C. Fawkes
Water-wheel....C. C. Wais
Waters, Preparing potable....J. T. Harris
Wave-motor....J. D. McFarland, Jr.
Weather-strip....W. Steger
Weaving apparatus, Veneer-strip-....H. E. Hull
Welding machine, Flue-....K. Mathers
Wheel....C. E. Pardridge and O. H. Hertel
Wheel retainer, Vehicle-....F. O. Patten
Whiffletree....T. S. Moffett
Whip-socket....F. T. Wood
Whistles, Electromagnetic means for operating air and other....H. H. Freeman
Winding-machine....S. W. Wardwell
Window....J. W. Cooper, *et al.*
Window-frame, Concrete....A. Hitt
Window-screen....E. T. Peters
Window-ventilator....D. O. Davis
Wire and rod coiling and cooling device..J. Remmen
Wire-hat-frame-making machine....M. Yaeger
Wire-post-making machine....H. E. Schnabel
Wire-straightener, Rotary....F. E. Vandercook
Wrench....S. A. Holman, *et al.*
Yoke center, Neck-....S. H. Renville

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MECHANICAL PATENTS.

Account-register....C. Clundt and J. Reidt
Acid derivative, Guaiacol carbonate sulfo-....A. Einhorn
Acid, Derivative of aminoarylarsinic....P. Ehrlich and A. Bertheim
Advertising device....J. E. Dowsing
Agglomerating-machine....O. Crochet
Agricultural-machine-seat-adjusting mechanism..J. Burd
Air and steam coupling, Automatic..J. V. Robinson
Air-brake....L. E. Morel
Air-brake systems, Angle-cock support and lock for reissue....W. E. Sharp
Air compressor and intercooler, Combined....J. G. Leyner
Air inlet, Fresh-....E. B. Henry
Air-ship....W. C. Ferry
Air-supply device, Fresh-....F. S. Lippitt
Air through barrels, Pneumatic syphoning system for circulating....J. F. McLain
Alloy, Metallic....G. Hartmann
Alumina, Manufacture of....G. McCulloch
Alumina, Recovery of soda in the manufacture of....H. C. Peffer
Alumina, Removal of silica in the manufacture of....H. C. Peffer
Amusement device....N. P. Litlander, *et al.*
Animal-trap....J. Jackson, *et al.*
Ankle-brace....F. J. Sescila
Apparel attachment, Wearing-....A. Goldberg
Arch-support....D. Livignano
Astronomical apparatus....J. C. Moore
Autograph register....E. J. Barker
Ax....S. Amster
Axle-nut-locking device....T. W. Caudle
Axle-skein....E. D. Hassenplug
Ball-mill....P. Lindhard
Bath tub leg....W. H. Lose
Battery....W. Gardiner
Battery case, Glass storage-...F. L. O. Wadsworth
Bearing....L. C. Trent
Bearing, Antifriction-....C. A. Latham
Bearing, Ball-....C. F. Jenkins
Beater and mixer....P. L. Pean
Bedstead, Metal....W. A. Wylie
Beet digger and topper....W. C. Mauer
Beet topper and puller....W. F. Elkin
Belt-fastening device....J. R. Colden
Bicycle handle-bar....J. R. Logan
Bicycle leading attachment....C. A. Mason
Billet-heating furnace....C. J. F. Johnson
Binder, Loose-sheet-book....E. Jay
Binocular....K. Martin and G. Stiege
Blanks, Machine for the formation of..D. J. Bogan
Block-signal system..J. D. Nix and L. M. Dalgarn
Boiler-alarm....F. C. McAdam
Boiler furnace, Steam-....F. Wagner, *et al.*
Boiler-tube cleaner....J. D. Thompson
Book, Car-record....A. J. Camp
Book-leaves, Reinforcement for....F. H. Crump
Book-mark, line-guide, and pencil-holder, Combined....M. E. Smoot
Bottle-capping-machine head....L. C. Krummel
Bottle, Non-refillable, 2 pat....H. W. Deutsch
Bottling machine, Liquid-....F. W. Jacob
Brake-head, Adjustable....W. E. Fowler, Jr.
Brick, Facing-....J. N. McQuern
Brick-setting frame....R. C. Penfield
Brick, Vitrified paving-....K. Langenbeck
Brush....F. W. Riehl
Brush, Cloth-steaming..L. Svoboda and F.Kopecky
Brush, Fountain paint-....O. Anderson
Bucket, Collapsible....D. M. Orcutt
Building construction....E. D. Martin
Building-mold....D. M. Eddy
Burner attachment....F. J. Farr
Button-making machine....A. C. Jones
Cable-hauling apparatus....F. Shaw
Cable-thimble....O. E. Strehlow
Calking-tool, Right and left....A. Serfoss
Camphene, Preparation of....O. L. A. Dubosc
Can-testing machine....C. B. McDonald
Car-brake....C. V. Rote and P. E. Shee
Car-coupling....S. W. Wright
Car-coupling operating mechanism, Automatic-, reissue....E. E. Turney
Car-door....F. X. Malocsay
Car-door hanger, Freight-....A. O. Banks
Car-fender....W. R. Bruce and F. Coutts
Car-mover....W. McLeish
Car, Passenger railway-....J. H. E. Branson
Car pipe-line coupling....P. A. Senecal
Car-rack....P. N. Landine
Car sand-box....D. B. Keeports
Cars, Traveling ladder for sleeping-..S. M. Niblack
Carbureter....M. F. Mieville
Carousel....A. J. Smith
Carousel power mechanism....H. B. Auchy
Carpet end-binder, Aisle-....E. Posson
Carpet-molding..H. B. Rodgers and M. Schwartz
Cart and wagon bodies, Wear-strip for....J. T. Hamilton
Cart, Dump-....L. H. and A. Young
Castings by air-pressure, Means for making....O. J. Sayers
Catch, Holdfast spring-....T. Morris
Catch, Safety-....A. J. Thurstans
Cattle-guard....C. L. Wilcox
Chain wrench....C. E. Bonner
Chair attachment....F. Schulz
Charm and trimming....E. S. Goddard
Cheese-cutting apparatus....E. J. Kunick
Chuck....S. T. Lewis
Cigar-lighter, Electric....S. A. Campbell
Circuit-breaker, Automatic....J. N. Kelman
Circuit closing and breaking device for electrically-operated annunciators, &c....A. May
Clamp....F. J. Christman
Clasp....L. S. Murdock
Cleaning device....G. B. Hakins
Clothes-line fastener....A. Bertram
Clothes-line reel and stretcher....M. Kerrigan
Clothes-pin, Reinforced....G. Langgons
Clothes-wringer..R. Walther,Jr.,and W. H. Scherer
Clutch and governor, Combined....F.F.Parker
Clutch, Frictional....W. H. Haggard
Coaster and bottle-opener....E. A. Parker
Cock, Stop and waste....W. H. Smith
Colter, Plow-....W. J. Wieder
Column-clamp....A. H. Schwerd, Jr.
Comb....E. Caldwell
Combing-machine feeding device, Heilman....J. C. A. Wenning
Composing-machine, Record-strip....J. S. Bancroft and M. C. Indahl
Composition of matter....G. W. Rowe and G. A. Hoyard
Computing device....J. S. D'Ribbard
Concrete-building-making machine...A. S. Merrett
Concrete for the construction of fireproof buildings, Fiber....G. Leonhardt
Concrete post, Reinforced-....P. J. Haas
Condiment-holder....A. Hitt
Confectioners' melting-table....G. F. Closen
Container-closure....H. N. Norton
Converter starting device, Vapor-...P. H. Thomas
Cooking-cabinet and heat-conservator....B. F. Carpenter
Copper from raw unroasted ores and other products, Extraction of....G. Schneider
Copying-machine cutting device....A. Zeiss and F. Rudert
Corn-husking machine....M. G. Darvey
Corn-tester, Seed-, reissue....C. E. Twamley
Corner-staying machine....W. F. Morse
Corset....K. V. Tolette
Cotton-gin....E. L. Peterson, *et al.*
Couch....A. H. Keller
Crate, Collapsible..W. S. Smith and F.L.Cosgrove
Crate, Collapsible..E.L.Cosgrove and W. S. Smith
Crate, Folding....S. W. Lane, Jr.
Cream-separator....K. O. A. Carlsson
Creel and kit, Combined....H. W. Wakefield and C. F. Porter
Crib or bed, Folding....E. Gundelach
Cultivator....F. E. and J. S. Bracley
Cultivator adjustable tool-joint...W. H. Durfee
Cultivator, Automatic adjustable..W. L. Logan
Culvert, Metal..F. A. Sicklesteel and F.C.Pallard
Curtain-bracket....J. D. Sullivan
Curtain-fastener..G. B. Johnson and R. C. Cotton
Cuspidor....S. B. McDermott and H. C. Mory
Cycle-support....A. Linde, R. Welde, E. Fickler, and R. Redewald
Davit for hoisting and lowering boats, 2 pat....A. Welin
Delivery apparatus....E. T. von Kropke
Detergent....J. Pearson
Detonator, Electric....G. A. Allen
Die for pressing wheels and like shapes....A. K. Andrews
Dining-table, Self-waiting....L. E. Johnston
Dish-washer....M. L. Crouch, *et al.*
Dish-washing machine....A. M. Hauberg
Display-rack and storage-frame....E. F. Baker
Door and window pattern....A. W. Keener
Door-closure....K. W. Gale
Door construction, Sliding-....B. K. Hussey
Door-hanger....F. J. S. Miely
Door-operating mechanism....H. Rowntree
Door-operating mechanism....G. Mazzolini
Door-release, Electrically-operated....W. H. Snyder
Door-stop....W. Poettcher
Draft-equalizer....J. Van Matre
Draft-equalizer....L. E. Ward
Draft-equalizer....J. Vau Matre
Draft-rollers, &c., Covering for....Z. T. Subers
Draw-bar and draft attachment....W. Fryberger
Dredging-bucket....J. B. Rickards
Drilling attachment for various classes of machines....F. E. Bocorselski
Dynamos and motors, Means for holding in place laminations of alternating-current....C. E. Willey
Egg-beater....M. D. Christin
Egg-case fastening....J. G. Dutschke
Electric alarm....R. C. Pronsen
Electric attachment-plug....S. W. Ito
Electric furnace....reissue....A. C. Higgins
Electric heater....H. W. Denhard
Electric protection system....O. Jacobsen
Electric wiring protecting-box....H. W. Eden
Electrical devices, Strain relief for....G. W. Goodridge
Electrodes, Making active material for storage-battery....J. W. Aylsworth
Electrolytic apparatus....A. Brichaux
Elevator....D. C. Suplee
Elevator....J. S. Muckle
Embroidery punching-tool....M. N. Jarvis
Engine electric igniter, Gas....J. A. Charter
Engine reversing mechanism, Traction....J. D. Musser
Engine starting-crank, Internal-combustion....J. A. Lawson
Evener....W. A. Paul
Excavating-machine....M. G. Punnell
Exerciser....F. P. Fay
Exercising apparatus....W. P. Stull
Exercising apparatus, Electrical..W. C. Shaufler
Exercising-machine....L. S. Hackney
Exhibition apparatus....R. C. Adams
Explosive-engine....F. H. Treat
Eyeglass-chain reel....O. B. Wedell
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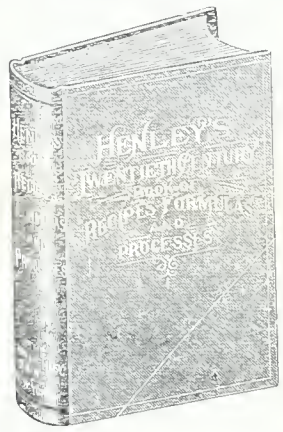
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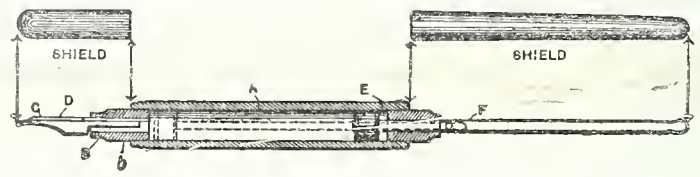
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